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The Impact of Multimedia Anchored Instruction on the Motivation to Learn of Students With and Without Learning Disabilities Placed in Inclusive Middle School Language Arts Classes

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Dedication

I dedicate my dissertation to my parents, parents-in-law, and my brother in heaven

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The Impact of Multimedia Anchored Instruction on the Motivation to Learn of Students With and Without Learning Disabilities Placed in Inclusive Language Arts Classes

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The purpose of this study was to investigate the impact of multimedia anchored instruction in language arts on the motivation to learn and academic achievement of students with and without learning disabilities (LD) enrolled in a seventh-grade general education classroom setting. Anchored instruction incorporated research-based instructional components including the multimedia video anchors, authentic tasks and learning activities, promoted discussion and communication when working as a group, integration of technology and effective learning strategies, and students' chances to control own learning activities.

The study was conducted in seventh-grade inclusive classrooms. Two teachers and 80 randomly selected students including 28 students with LD participated in the study. A quasi-experimental comparison-group design was utilized, experimental classes received the anchored intervention, and comparison classes received non-anchored

instruction. Measures included two self-report questionnaire scores as well as two academic achievement test scores.

Results indicated that students in anchored instruction group made significant gains of peer learning, interestingness, and less work avoidance than non-anchored instruction group. In addition, the results of within-group analysis demonstrated that the anchored instruction students' scores of task value, peer learning, subjective competence, interestingness, and performance orientation changed significantly after completing the anchored instruction. Moreover, students with LD who received the anchored instruction improved their motivation to learn and academic achievement to a level similar to students without LD. The overall results of this study suggest that anchored instruction is an effective instructional approach that integrates technologies into the classroom learning as a medium for enhancing students' motivation to learn and academic achievement.

Table of Contents

List of Tables

List of Figures

CHAPTER I

Introduction

The integration of technology in classroom learning is a central feature of current education reform. The National Education Technology Plan (Paige, Hickok, & Patrick, 2004) reported that technology is now changing the classroom learning and teaching environment. Researchers have investigated the potential impact of integrating technology to create new learning environments for students with learning disabilities (Maccini, Gagnon, & Hughes, 2003; Woodward & Rieth, 1997). Anchored instruction is technology-based instructional approach that has successfully demonstrated the pedagogical benefits of an integrated video-based learning environment. In particular, past studies (Cognition Technology Group at Vanderbilt [CTGV], 1992;Glaser, Rieth, Kinzer, & Peter, 1999) of the effects of anchored instruction commonly demonstrated that it can be influential on students' motivation to learn because it situates and anchors instruction in an interesting and realistic video-based macro-context that makes learning more motivating, meaningful, and useful for subsequent problem solving.

PROBLEM STATEMENT

Not surprisingly, learning and succeeding in school requires active participation and motivation to learn. The National Research Council (2004) designated motivation to learn as a critical factor in improving academic achievement and having a successful school life. More importantly, this report emphasized the critical role of motivation to learn for students with special needs and students from a low socio-economic-status (SES) communities. Dweck (1989) reported that motivation is highly predictive of students' class behaviors and engagement in academic tasks. Relative to students with

learning disabilities (LD), they should invest considerable energy to learning so that they can bypass their weakness and overcome their academic deficiency compared to their peers without LD. However, Sideridis, Mouzaki, Simos, and Protopapas (2006) demonstrated that motivation is one of the strong predictors of reading comprehension by students with LD. In a recent study, Morgan and Fuchs (2007) found that reading skills and the motivation to read were correlated. Vaughn, Gersten, and Chard (2000) demonstrated in a recent research synthesis that motivation to learn is one of the three most critical variables that influence learning outcomes for students with LD.

Typically, motivated students approach a task with confidence, persistence, and resourcefulness (Anderman & Maehr, 1994; Bandura, 1993; Zimmerman & Martinez-Pons, 1998). They are actively using learning strategies to progress from simple memory to complex understanding. Furthermore, unlike passive students, they proactively plan, monitor, evaluate, control their learning process, and take the necessary steps to achieve learning goals. When they encounter obstacles such as a poor study environment, difficult contents, or excessive anxiety, they seek out alternative ways including available resources, or adjust their initial goal in order to succeed (Hofer & Pintrich, 1998; Zimmerman, 1998). Overall, a number of studies have documented motivation's positive impact on learning across academic domains and on academically appropriate behaviors (Borkoski, 1992; Bouffard & Couture, 2003; Garcia & De Caso, 2004; Trainin & Swanson, 2005).

However, motivating students with LD to be cognitively and behaviorally engaged in the general education classroom setting is one of the challenges for teachers as they struggle with the sizable numbers of students with LD. Indeed, since the Individuals with Disabilities Education Act (Congress, 1997), approximately 12% of students enrolled in public schools are students with disabilities, and they are spending at

least 80 % of their school day in a general education classroom setting (National Center for Educational Statistics, 2005).

Students with LD who are cognitively disengaged and unmotivated generally tend to have negative attitudes toward content courses, classroom activities, and school life (Anderman & Maehr, 1994; National Research Council, 2004). These characteristics are incompatible with functioning as an independent learner in general education classroom settings. Consequently, they tend to demonstrate pronounced deficits in academic skills and poor to below-average performance in content courses (Margolis & McCabe, 2004; Morgan & Fuchs, 2007; Starratt, 2003), and they show increased occurrences of inappropriate classroom behaviors, such as off-task dawdling, distractibility, and being withdrawn (Bender & Smith, 1990). As a result, most of them are not meeting the state and federal academic standards (McLaughlin & Thurlow, 2003). Moreover, these behaviors may result in cumulative academic deficits that broadening the achievement gap with typically achieving students.

The cumulative academic deficits encountered by this group of students, particularly students with LD, tend to become most apparent in middle school, and reach a critical point in high school (National Center for Educational Statistics, 2005). Furthermore, from middle school forward, students who have low motivation often exhibit what is called learned helplessness, a general low level of motivation attributed to the belief that nothing they could do will make a difference (Valas, 2001). At this point, without effective intervention, students with LD who have low motivation are at risk for the deteriorating of already low level academic achievement, particularly severe deficits in higher-order thinking skills, as well as basic literacy skills (Glaser et al., 1999;Woodward & Rieth, 1997). In particular, literacy skills have been shown to be

critical in improving students' academic success in school and in later life (National Reading Panel, 2000).

Unfortunately, students with LD typically have not responded well to traditional instruction (Kinzer, Gabella, & Rieth, 1994; Welch, 1992). Furthermore, motivation to learn cannot be easily acquired without appropriate interventions (Anderman & Maehr, 1994; Blumenfeld et al., 1991). Therefore, researchers have tried to develop alternative interventions that integrate evidence-based instructional components to improve students' motivation in a general classroom.

TECHNOLOGY AS AN ALTERNATIVE INTERVENTION

For decades, technology has been considered one of the potent tools for improving students' motivation to learn. The National Educational Technology Plan (Paige, Hickok, & Patrick, 2004) reported that today's students feel strongly about the positive value of technology and rely on technology as an essential and preferred component of every aspect of their lives. Aligned with this report, Swanson and Hoskyn (1998) found that technology was one of a few instructional components that increased the predictive power of treatment effectiveness, regardless of the general model of instruction, age, and variations in methodology for students with LD.

However, as Clark (1983) argued, technology itself does not guarantee a positive impact on motivation to learn, or on academic achievement. Technology should incorporate the evidence-based instructional variables to create learning conditions that spur students' participation and teachers' active roles in instruction (Fitzgerald & Koury, 1996;Maccini et al., 2003;Woodward & Rieth, 1997). In other words, whether interventions for students with LD employing technology are successful is dependent upon how they are designed and used. One of the instructional approaches that actively

integrates technology into the evidence-based instructional principles is anchored instruction.

Anchored instruction employs the instructional principles inherent in a constructivist perspective on cognition and learning (CTGV, 1991, 1992). In particular, it emphasizes anchoring or situating instruction in the context of an information-rich video environment that encourages students and teachers to pose and solve complex and realistic problems (CTGV, 1993a, 1993b). A series of prior studies that employed anchored instruction demonstrated positive results for students with mild disabilities in the areas of literacy and social studies (Glaser et al., 1999;McLaughlin & Thurlow, 2003;Woodward & Rieth, 1997), critical thinking (Hur, 2001), basic skills and knowledge transfer in math (Bottge, Heinrichs, Chan, Mehta, & Watson, 2003; Bottge, Heinrichs, Chan, & Serlin, 2001; CTGV, 1998), and word definition ability (Xin, Glaser, & Rieth, 1996).

Apparently, anchored instruction seems to include several critical components that contribute to motivating students to learn and to be cognitively engaged (CTGV, 1990;Maccini et al., 2003). They include (a) authentic task characteristics that can more easily connect learning conditions with their original contexts, (b) multiple representations and perspectives on information, (c) vicarious experiences based on contextualized learning, (d) feeling ownership of learning processes and learning accomplishments, and (e) rich collaborative interactions between peers and teachers.

Consequently, anchored instruction can increase the student's subjective competence and value on tasks (Donovan, Bransford, & Pellegrino, 1999; Glaser, Rieth, Kinzer, & Peter, 1999). In particular, video-based anchors seem helpful to the students with LD who typically demonstrate poor literacy skills that influence passive attitudes toward learning activities. In video-based learning conditions, students with poor literacy

skills have been shown to develop mental models and a shared context on which to base classroom discussion from a variety of representations of information (CTGV, 1992; Kinzer, Gabella, & Rieth, 1994). They assist students with LD to understand complex concepts and improve their motivation to learn and achievement (Hasselbring & Moore, 1996; Okolo & Ferretti, 1996).

RATIONALE FOR THE STUDY

Despite the potential benefits of anchored instruction, limited attention has been devoted to systematically examining the effects of anchored instruction on motivation to learn of students with and without LD. Furthermore, researchers voiced concern about the sudden decline of students' motivation to learn after transition from elementary to secondary school (Anderman & Martin, 1994). This study investigated the impact of anchored instruction on 7th grade students with and without LD's motivation to learn in language arts.

The majority of previous studies of anchored instruction have investigated its cognitive impact on students' learning. While a few studies reported data on students' satisfaction (Woodward & Rieth, 1997;Xin, 1993), task engagement (Xin, 1993), and students' perception on activities (Bottge et al., 2003;Glaser et al., 1999;Woodward & Rieth, 1997), they employed limited data collection instruments (e.g., interview and observation) regarding student motivation to learn (e.g., satisfaction). On the other hand, this present study comprehensively examined the impact of anchored instruction on the motivation to learn of students with and without LD.

Second, there is a need for research to identify how to design an intervention that improves motivation to learn and student academic achievement (National Research Council, 2004). The integration of both motivational impact and academic achievement in intervention research should result in a more motivating classroom with more deeply

engaged students and may yield comprehensive data on the relationship between students' outcomes and their level of motivation.

The data on motivation to learn may help explain why some students succeed while others fail, despite having similar cognitive abilities and learning in similar environments. Past studies typically identified effective intervention approaches based on students' academic outcomes (Swanson & Hoskyn, 1998). However, as Maehr and Meyer (1997) argued, the effects of intervention should extend beyond immediate academic achievement. It should consider more broadly the development of life-long learners who continually invest their time, energy, and talent in learning activity.

Third, to date, constructivist-based interventions designed for students with LD have been limited in their application despite their proven potential to produce positive impact on learning (See Swanson & Hoskyn, 1998). Many researchers who support the intensive-explicit instructional approach for students with LD argued that students with LD are unable to benefit fully in a constructivist learning environment (Poplin, 1988; Tarver, 1996; Woodward & Montague, 2002). They argue further that students with LD may not be sufficiently motivated to deal with complex tasks, because they have specific learning challenges such as deficits in basic skills, meta-cognition, comprehension, and problem-solving skills (Tarver, 1996; Woodward & Montague, 2002). Therefore, they are unable to fully access or experience the benefits of a constructivist approach when compared to their peers without LD (Buzhardt, Greenwood, Abbott, & Tapia, 2006). The results of Swanson and Hoskyn (1998) support this argument that explicit and direct instruction is most effective for students with LD.

Conversely, researchers who supported a constructivist approach for students with LD criticized the intensive-explicit approach, calling it a reductionist approach which divides the learning experience into small decontexualized pieces, stating the opinion that

an intensive-explicit approach to instruction removes the real meaning and pleasure from learning (Glaser, Rieth, Kinzer, & Peter, 1999; Hasselbring & Moore, 1996). Furthermore, they contended that this approach might fail to motivate students with LD to improve higher-order thinking skills.

Indeed, many studies (Bottge, 1999; Hasselbring & Moore, 1996; Hur, 2001;McLaughlin & Thurlow, 2003) reported similar effects for constructivist approaches to improve literacy, mathematics, and critical thinking skills for students with LD, compared to their peers without LD. This study examined whether a constructivist approach, such as project-based learning or problem-based learning, can be effective in motivating and engaging students with LD at the same level as students without LD.

Finally, researchers (Licht, 1983; Torgesen, 1982) insisted that students with LD are less active and have lower levels of motivation in self-efficacy (Ferretti, MacArthur, & Okolo, 2001; Okolo & Ferretti, 1996) compared to students without LD. However, other researchers (Pintrich, Anderman, & Klobucar, 1994) provided contradictory results. They demonstrated that students with LD did not differ from students without LD on self-efficacy, intrinsic orientation, and anxiety, although they displayed lower levels of metacognition. Therefore, more studies need to investigate the motivation, including the area of self-efficacy of students with LD. This study seems valuable in explaining the characteristics of students with LD based on affective profiles in addition to cognitive profiles. In summary, as many researchers have emphasized (Lepper, 1988; Pintrich, 2003), one of the most interesting and relevant educational research problems is to determine the relationships between motivation to learn and learning outcomes.

PURPOSE OF THE STUDY

This study had three objectives. The first objective was to analyze the impact of anchored instruction in language arts on the motivation to learn and academic

achievement of students with and without LD enrolled in a 7th grade general education classroom setting. The second objective was to analyze the difference in motivation to learn language arts between students with and without LD before implementing intervention. The third objective was to examine the relationship between motivation to learn and academic achievement.

RESEARCH QUESTIONS

The research questions that guided the research were the followings:

1. What is the impact of participation in anchored language arts instruction on the motivation to learn and academic achievement of students with and without learning disabilities, as compared to students receiving non-anchored instruction?
2. Are there any differences in the motivation to learn language arts between students with and without learning disabilities?
3. What is the relationship between improved motivation to learn and academic achievement of students with and without learning disabilities?

CHAPTER II

Literature Review

In this chapter, literature on motivation to learn of students with LD and the impact of anchored instruction on motivation to learn is explored to provide a foundation related to the research questions of this study. Therefore, the review of literature includes; (a) the importance of students with LD's motivation to learn placed in a general education classroom, (b) the exploration of motivations that are critical to learning in classroom setting, (c) the issues related to technology and motivation to learn, (d) the exploration of anchored instruction including theoretical foundation and the critical instructional components that are expected to impact on students' motivation to learn, and (e) a synthesis of the results of studies on the effects of anchored instruction on motivation to learn including the research methodological issues of past studies.

IMPORTANCE OF MOTIVATION TO LEARN OF STUDENTS WITH LD IN A GENERAL EDUCATION CLASSROOM SETTING

Currently, as the Individuals with Disabilities Education Act (IDEA, 2004) mandates that students with disabilities be educated in the least restrictive environment, the number of students served in general education classrooms under IDEA has grown each year since 1993 (U.S. Department of Education, 2003). Naturally, about 12% of students enrolled in public schools are students with disabilities, and they are spending at least 80 % of their school day in a general education classroom setting (National Center for Educational Statistics, 2005). They also are expected to make adequate yearly progress in a general classroom to meet the high academic standard (No Child Left Behind Act of 2001).

Consequently, educators are looking for available supports for students with disabilities in a general class setting to increase the likelihood that they would meet the stringent academic standards. The most common supports available to students with disabilities to access in the general education are curriculum modifications and instructional adaptations (U.S. Department of Education, 2003). However, researchers (Deshler & Schumaker, 1993; Morgan & Fuchs, 2007) voiced concern about the adequacy of those supports for students with disabilities in general education classroom settings. Teachers are typically reluctant to modify their instructional routine significantly for students with LD, and they teach students with LD in a large group without the provision of differentiated learning contents or opportunities for them. As a result, students with LD struggle in a general classroom (Kroesbergen & Van Luit, 2003; McIntosh, Vaughn, Schumm, Haager, & Lee, 1993; Pavri & Luftig, 2000).

Spending more time in a general education setting requires students with LD to be more independent learners as teachers struggle with the sizable numbers of students, particularly students with disabilities. Independent learners are those who are sufficiently motivated to learn (Paris & Oka, 1986). Students with high motivation to learn approach a task with confidence, persistence, and resourcefulness. Unlike passive students, they proactively plan, monitor, evaluate, and control their learning process, and take the necessary steps to achieve learning goals.

Furthermore, current studies on motivation and cognition indicate that self-regulatory learning skills are closely correlated to motivation level (Montalvo & Torres, 2005; Pintrich, 2004; Zimmerman, 1998). Motivation impacts on students' use of self-regulatory learning skills that are critical for students' independent learning. Self-regulatory learning skills cannot contribute to learning without students' confidence of their use of self-regulatory learning skills (Bandura, 1993; Zimmerman, 1998).

MOTIVATION TO LEARN OF STUDENTS WITH LD

Motivation Constructs That Are Important For Successful Classroom Learning

Motivation to learn drives a person to engage in a particular learning activity, persist with task, and make students initiate and direct their learning behavior (Hickey, 1997; Pintrich, 2003; Theall, 1999). Pintrich (1999, 2003) suggested three components that seem to be important in a classroom context for successful learning to occur. These are (a) self-efficacy belief, (b) task value belief, and (c) goal orientations.

Self-efficacy is the judgment of one's capabilities to do the assigned academic tasks (Bandura, 1993). Studies have consistently demonstrated that self-efficacy is strongly related to students' task choice, level of cognitive engagement, and persistence on a task (Bandura, 1997; Pintrich, 1999). Therefore, students with high self-efficacy level to participate more readily, work harder, persist longer, and have fewer adverse emotional reactions when they encounter difficulties (Bandura, 1997).

Specifically, Pintrich (1999, 2003) indicated that self-efficacy is one of the strongest positive predictors of academic achievement. He demonstrated that self-efficacy accounts for 9-25% of the variance in academic achievement. Zimmerman and Kitsantas (1999) also found that the level of students' self-efficacy was closely correlated with their writing task approaches. For example, students with a high level of self-efficacy tried to revise their writing more frequently than students with low self-efficacy level. According to the meta-analysis of about 70 studies that investigated the relationship between self-efficacy and persistence on task and academic achievement (Multon, Brown, & Lent, 1991), there was a significant positive effects size of students' self-efficacy on persistence and academic achievement.

Task vale refers to students' belief about the importance of the task, their interest in the task, and their perception of the utility value of the task for the future goals (Meece,

Wigfield, & Eccles, 1990). Students are likely to engage in a wide range of activities if they find the task more valuable. Studies (Greaney & Hegarty, 1987; Guthrie et al., 2006) on the task value have shown that they are positively related to student engagement and cognition in the classroom setting.

Finally, *goal orientation* is whether the focus is on mastery and learning of the task, or extrinsic reasons for doing the task such as grade. Dweck and Leggett's (1988) comprehensive review demonstrated that mastery goal orientation account for 10-30% of the variance in the cognitive outcomes. In addition, many studies (Midgley, Kaplan, & Middleton, 2001; Pintrich, 1999) indicated that students with a mastery goal orientation are more likely to seek ways to become aware of their understanding and learning. More recently, Morgan and Fuchs (2007) reviewed three studies (Gottfried, 1990; Lepola, Salonen, & Vauras, 2000; Lepola, Vauras, & Mdki, 2000) that investigated the relationship between reading skills and motivation. The results of the study indicated that the goal orientations are bidirectionally correlated to motivation. For example, the results of Lepola, Vauras, and Maki (2000) indicated that 6^{th} graders' reading grades correlated .58 with their goal orientations. In particular, the coefficient was .72 for boys.

In another area of motivation research, the situated motivation constructs have been discussed (Boekaerts, 1987; Seegers & Boekaerts, 1993). They have been shaped by constructivist approaches to motivation (Hickey, 2003; Svinicki, 1999). The situated motivation conceptualized motivation in terms of task appraisals, task-specific motivation orientation, and strategic value that are more sensitive to a specific situation or activities (Boekaerts, 1987; Hickey, 1997).

Task-appraisals focus on how competent learners feel during an activity, and how much they enjoy the activities and see it as relevant to their own lives. This construct typically measures whether the learning activities were fun and were successful in

showing the usefulness. The results of Hickey (1996) indicated that constructivist math instruction influenced positively students' task appraisals. *Task-specific motivation orientation* is that it directs learners' cognitive ability towards goals that are connected with gaining knowledge. It includes learning orientation, performance orientation, and work avoidance as subcategories. According to Bereiter and Scardamalia (1989), students with high levels of motivation orientation have tendency to pour their cognitive efforts toward personal knowledge building rather than simply to complete their tasks. Consequently, they raise more questions and generate their own knowledge. *Strategic value* is related to students' use of learning strategies and their belief on the usefulness of the strategies. Strategic value influences on the variety of desirable learning activities including planning, reflection on their learning process, and persistence on tasks (Pressley et al., 1990). Therefore, strategic value is contributed to employ meaningful and knowledge-building activities rather than surface-level activities.

Motivation to Learn of Students with LD

Many studies demonstrated the differences in motivation to learn between students with and without LD in the areas of learned helplessness (Valas, 1999), goal commitment (Bouffard & Couture, 2003), goal importance (Sideridis & Padeliadu, 2001), self-efficacy (Ferretti, MacArthur, & Okolo, 2001), and self-esteem (Hasselbring & Moore, 1996). For example, the results of Ferretti, MacArthur, and Okolo (2001) reported that fifth grade students without LD had higher self-efficacy than students with LD. These results were consistent with a study conducted by Okolo and Ferretti (1996) although the participants were enrolled in fourth grade. Hasselbring and Moore (1996) revealed that students who were the first, second, and third grade students with LD had lower self-esteem in academic areas than social and parental areas. Therefore, currently, Sideridis et al., (2006) demonstrated that motivation including self-efficacy, motivational

force, task avoidance, goal commitment, or self-concept was highly accurate in identifying students with LD or at risk for LD. The results of this study indicated that the classification accuracy based on receiver operating characteristic curves ranged between 77% and 96%.

Historically, students with LD have been characterized as ‘inactive learners’ (Licht, 1983; Torgesen, 1982; Valas, 2001). Students with LD who have experienced repeated failures in learning often would develop low confidence in their own abilities. This low confidence promotes dependency on helpers (e.g., teachers, peers, and parent) (Kistner, Haskett, White, & Robbins, 1987) and it can increase learning avoidance-related behaviors (Sideridis, Mouzaki, Simos, & Protopapas, 2006). Unfortunately, low self-confidence in one’s own capabilities to master academic tasks have influenced negatively the development and the use of higher level of learning skills to complete learning tasks (Wallace & Kauffman, 1986). Consequently, they typically have difficulties in employing a sophisticated approach to learning (Ellis, Lenz, & Sabornie, 1987), assessing their own abilities (Palincsar, 1986), and asking for teacher help or assistance (McIntosh, Vaughn, Schumm, Haager, & Lee, 1993).

Moreover, they tend to fail to participate more, work harder, and persist longer when they encounter difficulties (Borkowski, Estrada, Milstead, & Hale, 1989). In addition, they often avoid volunteering to answer questions, and experience difficulties interacting with their peers and the teacher, and in setting up appropriate learning goals (Bender & Smith, 1990; McIntosh, Vaughn, Schumm, Haager, & Lee, 1993). Therefore, Okolo and Ferretti (1996) indicated students with LD tended to spend more time watching and listening and less time giving information, requesting information, and arguing or criticizing when compared to students without disabilities.

CRITICAL FEATURES OF EFFECTIVE INSTRUCTIONS THAT IMPROVE MOTIVATION TO LEARN OF STUDENTS WITH LD

A review that solely focused on components of motivation to learn related to effective instruction for students with LD has not been conducted. Furthermore, motivation studies from 1980's in special education are relatively conceptual (Borkowski, Estrada, Milstead, & Hale, 1989) or positional studies (Deci & Chandler, 1986; Paris & Turner, 1994; Torgesen, 1982). They focused on conceptualizing the various motivational constructs applicable for the students with LD or simply suggested more studies on motivation as a instructional factor for students' with LD. However, several studies (e.g., Ferretti, MacArthur, & Okolo, 2001;Hasselbring & Moore, 1996;Rieth et al., 2003) recommended instructional principles effective to improve students' motivation to learn after implementing interventions.

While each intervention study emphasized different instructional components, sequences, and teachers' roles, they share common principles of learning conditions needed to improve motivation including: (a) linking new tasks to recent successes to help students with LD to overcome learned helplessness (Margolis & McCabe, 2004), (b) teaching students with LD to attribute their success or failure appropriately (Brophy, 1983), (c) providing students with opportunities to identify and create moderately difficult personally important goals (Montague, 1992; Palincsar, 1986; Paris & Turner, 1994), (d) providing realistic feedback for students' efforts and persistence immediately after success or failure (Brophy, 1987; Stone, 1989), (e) providing modeling (e.g., self, peers, and experts), that helps students understand how to use the strategies and its value after learning (Paris & Oka, 1986), (f) provide students with LD explicit help to learn based on gradual transfer of control of learning from the teacher to the student (Swanson & Hoskyn, 1998), (g) teaching learning skills not only explicitly but also integrated into

existing curriculum (Deshler & Schumaker, 1993), (h) providing opportunities to use the learned strategies in real problem settings for maintenance and generalization (Borkowski, 1992), (i) integrating multimedia learning materials and technology applications into the curriculum (Woodward & Rieth, 1997), and (j) allowing students to produce their own products and promote mastery learning. When students have opportunities to experience the final products after efforts, they can understand the relationship between their efforts and accomplishments (Brophy, 1987). Anchored instruction is one of the instructional approaches that incorporate several of these critical features as instructional principles.

ANCHORED INSTRUCTION

The General Issues of Technology-Based Intervention on Motivation to Learn

Anchored instruction incorporates the advantages (e.g., multiple representations of information) of technology including a video and a computer. The general issues related to the use of technology in learning are also applicable to anchored instruction. Most common concerns about the technology use in learning are related with Clarks' (1983) critique of media effects including the novelty effects of technology introduction and a new intervention (Williams, 1992).

Clark denied that learning benefits including motivation accrue from adopting any specific media to deliver instruction. He argued that when students' motivation increased and they showed positive attitudes toward technology-based instruction, there was a significant increase in the teachers' modeling strategies, use of additional materials and guided practice, and other effective instructional characteristics when compared to the comparison group.

Over two decades, professionals have argumented about Clark's critique, however, Nathan and Robinson (2001) provided convincing reasons why both skeptics (e.g., Clark, 1983) and advocates (Kozma, 1994) did not reach the same conclusion. They pointed out that both skeptics and advocates could not reach consensus due to the different theoretical perspectives on learning, such as learning as the transmission of necessary information from teachers to students or a constructivist stance on learning.

Indeed, Clark (1983) stated that knowledge locates solely within the individual. But the individual and knowledge exists separately. Therefore, learning is the transfer of knowledge from one individual (teacher) to another individual (student) by media. From this perspective, learners are passive in the learning process. In contrast, Kozma supported the idea that learners actively build their own knowledge by participating in the learning environment. To him, media works as a powerful method for creating an enriched learning environment. Nathan and Robinson's review concluded that instructional media and principles (or methods) contribute to learning together in response to learners and learning processes.

Maccini et al. (2003) and Woodwoard and Rieth (1997) indicated that the primary approaches to technology for students with LD are limited to technology as a tutor, such as drill and practice in a computer program. They emphasized that students with LD do not consistently take advantage of technology as a learning environment despite their potential value. However, several researchers (Bottge, 1999;Hasselbring, 1994;Rieth et al., 2003;Xin & Rieth, 2001) have tried to create appropriate learning conditions for students with LD based on constructivist learning theory.

Theoretical Foundation of Anchored Instruction

Anchored instruction was conceptualized and investigated by the Cognition and Technology Group at Vanderbilt (CTGV) in 1990s (CTGV, 1990, 1991. 1992). Anchored

instruction refers to instruction where students learn knowledge that is presented in the context of specific anchors that serve to provide multiple perspectives of information (CTGV, 1990, 1991). McLarty et al., (1990) defined anchored instruction as "a rich shared environment that generates interest and enables students to identify and define problems while they explore the content from many different perspectives" (p. 2). It emphasizes particularly video-based "macrocontexts," which intend to overcome "inert knowledge" (Whitehead, 1929) by anchoring learning within the context of meaningful problem-solving activities (CTGV, 1992, 1993b).

Anchored instruction advocates have challenged traditional instructional environments, stating that they succeeded teaching the "right answer," but fail to teach how to transfer the right answers to problem solving situations (Donovan, Bransford, & Pellegrino, 1999). They argued that traditional instruction is typically focused on delivering and mastering knowledge in a decontextualized way (CTGV, 1990, 1993a). Consequently, students do not understand the value of their learned knowledge, and naturally they do not know how to apply that knowledge to problem-solving situations in real life. Whitehead (1929) labeled this kinds of knowledge "inert knowledge" that is unable to transfer to even similar contexts. Theoretically, anchored instruction was influenced by a variety of theories and instructional approaches. Most importantly, they are constructivism, contextualism and situated cognition, and cognitive apprenticeship.

Constructivist Learning Environments

From an epistemological point of view, constructivism proposes that knowledge is not fixed, but rather it is constructed by individuals through their interaction with objects in a particular context (Duffy & Jonassen, 1992). The meaning of specific objects (knowledge) is constructed by an individual learner's interpretations based on the

interaction with objects. According to this perspective, students cannot simply construct knowledge via the transmittal of new information by teachers (CTGV, 1992).

Students play key roles in constructing the meaning of knowledge within the social, cultural, and historical contexts (Crotty, 1998). They are no longer passive receivers of established knowledge in a classroom setting. They are actively participating in the teaching and learning process to collaboratively construct knowledge with teachers and peers (Glaser, Rieth, Kinzer, & Peter, 1999). Naturally, students direct their own learning procedures (Duffy, 1997; Vygotsky, 1978).

From this perspective, the teachers' role also change from one of transplanting knowledge to students and of telling students right answers and correct procedures to guiding student activity (Duffy, 1997). The teachers' goal is to develop rich learning environments that support students' construction of knowledge. Teachers pay more attention to creating environments that enable the student to experience the joy of learning rather than explicitly teaching them. The environments should be designed to support high levels of learner control, cognitive and behavioral engagement, higher-order thinking skills, particularly meta-cognitive reasoning (Donovan, Bransford, & Pellegrino, 1999; Jonassen, 2000; Jonassen & Henning, 1999). Teachers are joint problem solvers when students encounter obstacles to learning progress.

Contexualism, Situated Cognition, and Authenticity

Macrocontexts refers to complex learning situations that are to be explored by students and teachers from multiple perspectives (Brown, Collins, & Duguid, 1989; McLarty et al., 1990). Researchers (Duffy & Jonassen, 1992; Greeno, Collins, & Resnick, 1996) suggest that learning (cognition) is an activity that is reciprocally determined by the individual and environments. Therefore, learning can be explained in terms of the relationship between learners and their specific environments (Donovan, Bransford, &

Pellegrino, 1999). Conversely, traditional perspective on learning is typically based on transmission of necessary information from teachers to students without consideration on the contexts under which the learned knowledge is applied.

Based on macrocontexts, students can have the opportunity to reflect the relationship between the skills being learned and how they will be used in problem-solving situations (Duffy & Jonassen, 1992; Hasselbring, 1994). As anchored instruction emphasizes macrocontext, naturally it emphasizes maintaining complexity of content rather than over-simplification of knowledge without appropriate macrocontext.

Situated cognition is closely related area of research in terms of explaining students learning (cognition) based on the relationship between students and the properties of a specific environment (CTGV, 1990; Greeno, Collins, & Resnick, 1996). Brown et al. (1989) contended that learning is always situated, while Greeno et al., (1989) indicated that the best learning activities include the concrete situations, rather than abstracted representations of information.

Anchored instruction emphasizes “authenticity” of tasks and activities that reflect macrocontexts and situations. Authenticity is a transfer of learning issue (Hasselbring, 2001). Authentic learning is based on the set of beliefs that (CTGV, 1990; Glaser, Rieth, Kinzer, Colburn, & Peter, 1999): (a) learning is grounded in the concrete situation in which it occurs; (b) knowledge is not automatically transferred from a learning situation to real problem solving situations. For the effective transfer of knowledge, the learning condition and real problem solving condition should have shared elements; (c) instruction is grounded in using apprentice models to promote learning; and (d) learning needs to be implemented in complex social environment.

Cognitive Apprenticeship

A major goal of the anchored instruction is to help students experience the kinds of problems that content experts in an area encounter, and to understand how core concepts in a discipline help clarify these problems (CTGV, 1992). Students can observe how experts solve problems and engage in the same kinds of activities, such as problem-based, case-based, and project-based learning. Students use content knowledge and anchors as cues to solve the complex problem similar to that of experts. This experience helps students to transform knowledge learned in school into real problem-solving situations. In anchored instruction, teachers can take on the role of experts (Duffy, 1997). They react to the students' problematic situation by modeling and conveying ideas. In addition, they model how to identify problem situations, and find necessary resources, technical knowledge, and skills.

In summary, anchored instruction is challenging the traditional didactic view of education. In didactic instruction, students often find it difficult to apply their knowledge for solving complex problems in real situations (Bransford et al., 1990; CTGV, 1990) because the knowledge and meaning are acquired through abstract activities and stored in memory for later retrieval (Glaser et al., 1999). Whitehead (1929) termed this kind of knowledge as 'inert knowledge.' Alternatively, anchored instruction has concentrated on creating a naturalistic and authentic learning environment that encourages students to participate fully in academic activities in a socially supported and scaffolded environment rather than learning discrete skills in isolation.

There are six major advantages to anchored instruction. They are; (a) it can provide a realistic context, (b) the video provides a mental model or anchor for students' perceptions and comprehension, (c) it enriches understanding of what learners learned, (d) it can develop self-regulated learning strategies, (e) it can provide multiple

perspectives from which problems may be viewed, and (f) it assists students in applying knowledge to problems encountered in realistic environments. Apparently, the video anchor is the critical component of anchored instruction. It is expected to have a particularly strong impact on students' motivation to learn (CTGV, 1993b; National Research Council, 2004; Paige, Hickok, & Patrick, 2004).

The Impacts of Video Anchor on Motivation to Learn

Anchored instruction is implemented using a video-based anchor. That includes a complex problem set within the context of a story that helps structure learning activities designed to attain a designed conceptual goal (CTGV, 1990). In constructivism and situated cognition, video is considered as part of the supportive learning environments used to provide students with various forms of authentic, complex, and contextualized learning experiences (Hasselbring & Moore, 1996; Okolo & Ferretti, 1996). The video anchor serves as the focal point for initiating generative thinking and various interactions (Rieth et al., 2003).

Video can provide a rich sensory of information (visual and audio) compared with traditional text-based media. Multidimensional (multimedia) information facilitates the development of students' mental models and understanding of macrocontexts (CTGV, 1990). Video is especially useful as an instructional anchor because it allows students to view and discuss situations and subjects previously inaccessible and abstract to them (Ferretti, MacArthur, & Okolo, 2001; McLarty et al., 1990; Rieth & Polsgrove, 1994).

From a motivational perspective, the video anchor provides realistic stories or episodes to engage students in problem solving situations (Hasselbring & Moore, 1996). Video-based contexts also help teachers and students to share the common experiences. This shared experience promotes communication with a higher level of interaction (Rieth

et al., 2003), which is expected to increase students' subjective competence and self-efficacy (Stipek, 2002).

In addition, video anchors provide rich background knowledge by integrating audio and visual information with specific learning content (Glaser et al., 1999; Rieth et al., 2003). This audio and visual information feature could motivate students with poor literacy skills (Hasselbring & Moore, 1996). Students with poor literacy skills had difficulty fully understanding problem situations posed in print without the use of video content. Provision of background knowledge based on the dynamic nature of video was more beneficial to students with LD because they typically lacked in prior knowledge and they had problems with literacy skills (Glaser et al., 1999; Hasselbring & Moore, 1996; Rieth et al., 2003). Consequently, the video anchor provides opportunities for students to actively participate in class activities.

Furthermore, Pintrich (2003) indicated that students might fail to identify reasons that they acquire extensive time and effort to complete learning activities. Decontexualized instruction has been found to be ineffective as it has not motivated students because students do not know when and how to apply what they are learning (CTGV, 1993). In contrast, real life video-based contexts enable students to see the utility of knowledge and the video context helps them to understand the value of the importance or salience of the tasks for them.

EFFECTS OF ANCHORED INSTRUCTION ON MOTIVATION TO LEARN OF STUDENTS WITH LD

Two types of dependent variables were typically measured to investigate the effects of anchored instruction on motivation of students with LD; they included (a) motivation as psychological constructs and (b) behavioral indicators of students' motivation level. Regardless of types of dependent variables, studies of anchored

instruction demonstrated effectiveness on motivation. Ferretti, MacArthur, and Okolo (2001) and Okolo and Ferretti (1996) used anchored instruction to investigate motivation categorized as psychological constructs (Ferretti, MacArthur, & Okolo, 2001; Hasselbring & Moore, 1996; Okolo & Ferretti, 1996). The areas of motivation investigated were self-efficacy, intrinsic motivation, self-esteem, and attitudes toward cooperative learning.

The results of these studies were mixed based on the dependent variables employed. However, the effects of anchored instruction on students' self-efficacy were consistent across the studies. Ferretti, MacArthur, and Okolo (2001) investigated the effects of anchored instruction on fifth grade students with LD; strategy- supported project-based learning for historical understanding on students' self-efficacy for learning and performances, academic intrinsic motivation for social studies, and attitudes toward cooperative learning. Small groups of students implemented a project about the westward expansion that took place in the United States in the 19th century. The intervention was implemented over eight weeks and consisted of 14 lessons extending over about 25 to 29 class periods.

Students cooperatively investigated the experience of one of three emigrant groups: miners, farmers, and Mormons. They investigated the people, the problems they faced, the reasons for their decisions to travel west, the challenges they faced on the trip, and the outcomes occurring once they arrived. In particular, a narrative provides students with both a conceptual framework and strategic support for understanding historical content. To introduce the narrative strategy and teach students how to evaluate evidence, the first several lessons provided an anchor, The American Experience: The Donner Party (Public Broadcasting Service, 1992). This anchor showed a group of emigrants who took an alternative western route over the Sierra Nevadas. It allowed students to understand

background knowledge about the period in which the events occurred. In particular, the anchor was designed for students who had difficulties in reading and interpreting text.

Typically, group activities involved oral reading of the evidence and group discussion to share information and ideas. While implementing the project, students had opportunities to understand the importance of providing a true and accurate account of a historical event, ways to evaluate bias in evidence and to corroborate sources, and the need to qualify conclusions when there were contradictory accounts. All the materials that students investigated were authentic including primary sources that historians used in their investigations. They included diaries, drawings and photographs, memoirs, and letters. These authentic activities and materials allowed students to understand the processes used by historians to analyze and interpret historical evidence. Then, students created a multimedia presentation about the emigrant group they investigated and presented their project.

The results of this study indicated that self-efficacy increased significantly as a result of the intervention ($p<.01$) for students with LD and without LD. Self-efficacy included students' beliefs that they could get a good grade in social studies in general as well as in learning about westward expansion in particular. It included students' belief that they could teach social studies to others. However, the intervention did not influence students' academic intrinsic motivation level and attitudes toward cooperative learning with peers. Intrinsic motivation for social studies measured students' enjoyment of learning, specifically an orientation to mastery, curiosity, persistence, and the learning of challenging, difficult, and novel tasks (Ferretti, MacArthur, & Okolo, 2001). Okolo and Ferretti (1996) reported different results from this study except for the effect on self-efficacy.

Okolo and Ferretti (1996) studied the effects of anchored instruction for fourth grade students with and without LD in social studies. Students worked on their projects about three times a week during over approximately 25 sessions. They divided students into two groups. One group of students used project-based learning to learn about the advantages of industrialization while the other group learned about the disadvantages of industrialization. The advantages of industrialization were divided into two topics: transportation and communication. The disadvantages of industrialization were also divided into two topics: pollution and natural resources. Materials about the four topics were used from children's sections of local libraries. Researchers placed about five books per topic at the fourth-grade reading level. Students used these materials to gather pictures and text for their presentations. In addition, a short videotape about each topic was used. A classroom was equipped with a computer, a color scanner, and a printer to support students' development of their presentation.

The results of this study indicated that students' self-efficacy increased significantly ($p<.001$) in both groups. Furthermore, students' intrinsic motivation as well as their attitude toward cooperative learning also increased after intervention ($p<.04$). However, intrinsic motivation was not statically significant ($p<.05$). There were no group differences in self-efficacy, intrinsic motivation, and attitudes toward cooperative learning.

Students' self-esteem was investigated by Hasselbring and Moore (1996). Participating students were enrolled in grades 1-3. They reported the changes in students' self-esteem in four areas; general, social, academic, and parental. They compared a group that received contextualized video-based instruction with a group that received direct instruction in the four aforementioned areas. Students in the intervention condition watched a series of three anchors (episodes) about an elementary school setting with

which they were familiar. For example, the first anchor was about a new student coming to an experimental school. The new student needed information about the school building. Students were asked to create maps for the target student. In the second anchor, students extended their activities by creating a video showing their solution to the complex class schedule encountered by a new student. The third episode required students to focus on money handling skills to solve a problem situation where the toy was not what was advertised on television.

The results of this study indicated that students self-esteem academic ability scores increased significantly ($p<.02$) as a result of anchored intervention. Academic ability increased most substantially (10.3 points) among four areas of self-esteem. Despite the growth, the academic ability still remained lowest among four areas of self-esteem. The scores in the other areas of self-esteem increased but not significantly. This study did not report group differences between the treatment group and the comparison group (direct instruction) in the area of self-esteem. By contrast, this study reported group differences in the area of academic achievement.

The studies of anchored instruction that employed the observable behavioral indicators of students' motivation as dependent variables consistently reported positive results across the studies (Glaser et al., 1999; Hur, 2001; Rieth et al., 2003; Xin, 1993). The target behaviors included class discussion participations (e.g., question asking and question answering) (Glaser et al., 1999; Hur, 2001; Rieth et al., 2003; Xin, 1993) and on-task behavior (Xin, 1993). Students' daily interactions increased twofold (203.6%) per class period over baseline (Glaser et al., 1999) and less off-task behavior per class period (1-2) during intervention than the comparison group (3-5) during intervention (Xin, 1993). Furthermore, the quality of the target behaviors, question asking and answering, improved (e.g., from factual level to interpretive level) (Hur, 2001; Rieth et al., 2003).

The results of two studies employed the same intervention but reported slightly different results on students' question asking (Glaser et al., 1999; Rieth et al., 2003). Glaser et al., (1999) reported that the number of eighth grade students' asking questions at both the factual and interpretive level decreased 43.4% and 64.2% respectively although students' responses increased 145.9% compared to baseline data. They attributed the decrease of students' participations to the increase of peer interaction during group working. However, Rieth et al. (2003) demonstrated different results. The overall student participation (139% compared to baseline data) as well as the number of students' question asking increased about 217.6% during intervention. Only the number of students' short responses decreased (17%).

The results of the study conducted by Hur (2001) were consistent with Rieth et al. (2003) although this study did not consider the number of low-level questions asked. He compared the number of critical-questioning skills based on two levels, including higher order and low order skills to traditional language arts class. The results reported for students with mild disabilities indicated that the number of higher order thinking skills increased significantly during intervention ($p<.05$). This study also revealed the significant difference between anchored instruction and the traditional language arts class.

THE CRITICAL FEATURES OF ANCHORED INSTRUCTION THAT EFFECTIVELY MOTIVATE STUDENTS WITH LD

There is relatively little research regarding the specific instructional components of anchored instruction that seem to positively impact on the motivation and engagement of students with LD. This is because studies on anchored instruction in special education were based on the systemic research approach rather than on an analytic approach identifying specific variables that contributed to the positive effects on students'

motivation seems to be impossible. The systemic approach is more focused on conducting research in natural conditions, and it analyzes the intervention as a whole not separated into individual variables (Salomon, 1991). The limitation of this approach is the difficulty in identifying a specific component (or variable) that is critical to the effects of intervention.

However, according to the analysis of the previous anchored instruction studies **(**Ferretti, MacArthur, & Okolo, 2001; Glaser et al., 1999; Hasselbring & Moore, 1996; Hur, 2001; Okolo & Ferretti, 1996; Rieth et al., 2003; Xin, 1993**)** that reported a significant effect on the improvement of motivation of students with LD, several critical intervention characteristics commonly are employed and emphasized. They are: (a) authentic tasks; (b) discussion; (c) learner-directedness (learners played main roles in planning, controlling, and processing learning. Teachers' roles were supporting and scaffolding); (d) rich interactions among learners, students-to-video (students repeatedly visited the video), and learner-to-teacher; (e) linear instructional sequences (instruction had planned step-by-step steps based on contents' sequence and difficulty); (f) authentic learning activities (activities reflect ways to be used in real life, e.g., problem-based learning and project-based learning); (g) students' presentation of their outcomes; (h) learning questioning skills; (i) provision of background knowledge; (j) integrated strategy learning; and (k) integrating computer.

Authentic Task

An authentic task refers to learning activities, which present the same type of cognitive challenges that are consistent with the cognitive demands in the real world (CTGV, 1992). For example, students who learn history are engaged in the construction and use of history in ways that historians do. In a traditional classroom, students are frequently given problems or tasks that are of little relevance and bear little meaning to

them. In contrast, authentic tasks are more likely to increase the personal relevance of the materials and activities. Nwagbara's (1993) study found that students reported a greater willingness to expend effort in watching the video when it enhanced the relevance of the task for students rather than watching the same video contents without indicating the relevance of contents for them.

Multiple Representations and Perspectives of Information

Multiple representations of video information make abstract information more concrete. In addition, text and audiovisual information is not necessarily in conflict. Text can be combined effectively with visuals. Paivio's dual coding theory (1986) suggested that two types of information (verbal and imagery) are encoded by a separate subsystem. Video is beneficial because two separated but interconnected systems allow information to be stored in both systems, thereby enhancing a student's ability to remember and retrieve the information. Improved ability to recall information and to understand the utility of information to specific situations by multiple representations of information may contribute to students' participation in learning activities. In particular, it seems valuable to students with LD who typically demonstrate poor literacy skills. The poor literacy skills can be a factor that influences passive attitudes toward learning activities.

Furthermore, video technology enables students to experience multiple perspectives about a concept, an understanding, and toward a situation. Multiple perspectives provide a basis for the learner to test his or her own understanding and to develop the flexible types of understanding that allow students to use their learning effectively in real situations (CTGV, 1991; National Research Council, 2000). Koschmann, Myers, Feltovich, and Barrows (1994) suggested that a single mental perspective and method or approach is not likely to be sufficient for capturing the nature of the complex materials of learning. It implies that richness in concepts and information

can be missed with single representations such as text, and the simplification may prove misleading (Spiro, Feltovich, Jacobson, & Coulson, 1991).

Vicarious Experiences Based on Contextualizing Learning

Video can more easily connect learning conditions with their original contexts. Rather than isolating individual skills, video puts them into complex and dynamic situations similar to real life. This video provides students with an authentic base of experience in abstract domains. It may foster motivation to learn. In addition, students may not fully understand certain concepts or events without the aid of visualizations. For example, in the Ferretti, MacArthur, and Okolo' study (2001), the authors provided the realistic contexts illustrating westward expansion in the 19th century, an event far removed from the personal experiences of today's students, and one which would be difficult for students to comprehend without a visualization tool such as video.

Feeling Ownership of Learning Processes and Learning Accomplishments

Learner-centered characteristics of anchored instruction may contribute to the improvement of students' motivation (CTGV, 1992; Midgley, Kaplan, & Middleton, 2001). Anchored instruction provides students with ownership of the learning processes by allowing them to: select learning topics, set project goals, and prepare presentations (e.g., Ferretti, MacArthur, & Okolo, 2001; Hasselbring & Moore, 1996; Rieth et al., 2003).

More importantly, another key feature of anchored instruction is that ownership of learning is possible not only at the individual student level, but also at the group level. Working in collaboration with peers, students have opportunities to analyze a problem of practice, formulate hypotheses, and identify knowledge gaps to guide group research

activities. Through this experience, groups can develop a sense of cooperation and can share ownership of learning.

Furthermore, typically anchored instruction for students with LD (Ferretti, MacArthur, & Okolo, 2001; Harts, 1997; Hasselbring & Moore, 1996; Hur, 2001; Okolo & Ferretti, 1996; Rieth et al., 2003; Xin, 1993) emphasized students becoming producers of knowledge rather than merely knowledge consumers. For example, anchored instruction enables students to integrate class presentations with contents students generated. So, students have opportunities to share their knowledge products with their peers, parents, and teachers. In doing so, students showed pride in their production and satisfaction with the learning experience, which is particularly important for students with disabilities and with low motivation (National Research Council, 2000)**.** In addition, the opportunity for students to control the technology (e.g., videodisc) and to make discussion about selecting video scenes they need to support their research can positively impact students' motivation.

Rich Interactions with Peers and Teachers

Anchored instruction emphasizes rich interactions including interactions with video contents, and increased number of interactions of among students and their teachers (Glaser et al., 1999; Rieth et. al., 2003). Ferretti, MacArthur, and Okolo (2001) demonstrated that students' motivation was enabled by constructive conversations. That provided students with opportunities to understand the value of and future utility for what they were learning. Furthermore, they were able to compare their perspectives about and approaches to learning tasks with their peers and teachers. Specifically, group work based on peer interaction opportunities can affect motivation. Their contributions to the group were derived from the multiple perspectives informed by video information, and helped improve their confidence and understanding of the values of what they learned.

Anchored instruction increased teachers' active participation during intervention as teacher-directed instructional time decreased. The decreased instructional time required of the teacher does not imply that teachers are replaced by video. On the contrary, teachers used time saved to provide guidance, consultation regarding problem solving, and to monitor students' learning.

THE SUMMARY OF THE PAST STUDIES OF ANCHORED INSTRUCTION THAT INVESTIGATED ITS IMPACTS ON MOTIVATION TO LEARN

While the numbers of studies are clearly limited, a few anchored instruction studies that investigated its impact on students with LD's were conducted in areas that were not well researched like language arts and social studies (Hasselbring & Goin, 2004). The trend to explore these under-researched areas of curriculum is valuable considering the importance of literacy and social studies for students with LD (Kinzer, Gabella, & Rieth, 1994). However, the numbers of studies are clearly limited.

There are four possible explanations to explain the limited number of anchored instruction studies that have investigated the effectiveness of motivation for students with LD. First, intervention studies with motivation as a variable factor that influences learning were overlooked for a long time because past studies were more interested in improving students with LD's academic achievement including basic learning skills, knowledge acquisition, cognitive and metacognitive skills (Deci & Chandler, 1986; Spitzer, 1996). Until now, anchored instruction has focused primarily on the alignment of instruction with cognitive performance without recognizing the role of motivation in learning.

Second, as Hickey (1997) and Bandura (1993) indicated, motivation is the area of study that is difficult to predict and control. It also tends to resist change by specific interventions because motivation is developed by an individual's cumulative experience

over time. In addition, researchers typically thought that their role was to provide good quality instruction, while motivation to learn was the students' responsibilities (Svinicki, 1999; Pintrich, 2003).

Third, the majority of anchored instruction studies employed a systemic approach to the research (Okolo & Frretti, 1996; Salomon, 1992). They did not conduct studies separating individual variables or the components of anchored instruction. Salomon (1992) indicated that classroom-based interventions, particularly technology-related ones, are so complex and dynamic that controlling one variable or component is difficult. The complexity is a primary influence on the diminished number of studies. Finally, intervention studies with video applications themselves were limited in special education because typically interventions for students with LD have emphasized teachers' direct teaching.

METHODOLOGICAL ISSUES OF PAST ANCHORED INSTRUCTION STUDIES ON MOTIVATION TO LEARN OF STUDENTS WITH LD

Whereas the overall findings of synthesis of anchored instruction studies (Ferretti, MacArthur, & Okolo, 2001; Glaser et al., 1999; Hasselbring & Moore, 1996; Hur, 2001; Okolo & Ferretti, 1996; Rieth et al., 2003; Xin, 1993) on motivation to learn support the effectiveness of anchored instruction for improving motivation to learn, several methodological issues within the studies were raised.

First, the results indicated there was a lack of studies that included a comparison group in the research design. Naturally, the majority of studies were conducted at an intact setting rather than randomly assigned conditions. Gersten, Baker, and Lloyd (2000) suggested the way for a research design that includes a comparison group based on random assignment for a high-quality research. In the synthesis, the studies with comparison groups reported more mixed results than single group design studies.

However, it is notable that the studies that reported mixed results using comparison groups commonly demonstrated at least similar to better effects of anchored instruction on student motivation.

One of possible reasons for the lack of comparison studies is the tendency of technology-based intervention studies to avoid media comparison studies (e.g., video vs. text). Previous reviews (Kozma, 1994; Nathan & Robinson, 2001) of media studies suggested that media comparison studies are meaningless for improving the interventions. These studies argued that instructional variables are more important than the media characteristics. Therefore, studies with technology need to focus on investigating the instructional variables employed.

Another possible explanation for the lack of studies with a comparison group is related to measurement issues. Researchers who employed a constructivist approach to interventions argue that their approach and a traditional instructional approach cannot be measured with same measurement tools (Duffy & Jonassen, 1992; Williams, 1992). Traditional approaches to assessments focuses on testing students on factual knowledge and isolated skills. These kinds of tests are incompatible with the goals of constructivist instruction (Anderson, 1998; Williams, 1992). Furthermore, although students' motivation to learn improved by the interventions, if students are assessed on skills different from the ones previously experienced such as problem solving, they might feel that their learning activities are less valuable and inappropriate.

One possible solution to the assessment issue is to collect comparison group data during baseline on dependent variables relatively well matched to both traditional and constructivist goals of instruction. This approach may help overcome the problems of a lack of studies that have included a comparison group and the challenges of employing dependent variables that may be mismatched with theoretical approaches to interventions.

Related to this issue, anchored instruction study calls for alternative assessments that are well matched with their theoretical orientation. Past studies that investigated the effects of anchored instruction on students' class discussion participations in a natural and complex environment provided insights on the development of alternative data collection methods matched with their theoretical foundation (Glaser et al., 1999; Hur, 2001; Rieth et al., 2003; Xin, 1993). Typically, these studies employed naturalistic observation measures and they reported high inter-observer reliability.

Another issue is related to implementation fidelity. Past studies of anchored instruction on motivation did not report sound data on implementation fidelity level. Researchers (Cooper, 1994; Cooper & Reach, 2004) indicated that particularly the implementation checklist is valuable when replicating studies. Indeed, provision of detailed information about the implementation of the independent variable is important to provide evidence that the effect of an intervention may be due to solely planned intervention. It is more important in experimental conditions where teachers implemented the intervention because of the challenges of controlling implementation fidelity in a natural setting with teachers who are not yet familiar with intervention.

Finally, the majority of studies included did not report data on generalization and maintenance of effects. Measuring generalization and maintenance of interventions is particularly valuable for studies of motivation to learn because these two factors are typically believed to have a comprehensive influence on learning processes of learning across the curriculum (Pintrich, 1999, 2003).

CHAPTER III

Method

The purpose of this study was to investigate the impact of anchored instruction in language arts on the motivation to learn and academic achievement of students with and without LD enrolled in a 7th grade general education classroom setting. In addition, the relationship between motivation level and academic achievement was investigated. The research questions investigated were: (a) What is the impact of participation in anchored language arts instruction on the motivation to learn and academic achievement of students with and without learning disabilities, as compared to students receiving non-anchored instruction? (b) Are there any differences in the motivation to learn language arts between students with and without learning disabilities? (c) What is the relationship between improved motivation to learn and academic achievement of students with and without learning disabilities?

RESEARCH DESIGN

This study utilized a quasi-experimental comparison-group design (Campbell & Stanley, 1963). The quasi-experimental design was employed because participants could not be randomly assigned to instruction conditions and equal numbers of participants could not be enrolled in each group (Creswell, 2002). However, to minimize the non-randomized assignment effects, 40 students were randomly selected in each condition from the full participant list who consented to this study because over a total of 80 students were the suggested total sample size to get the over .80 Powers based on a .05 alpha level and .60 effect size (Erdfelder, Faul, & Buchner, 1996).

To determine the impact of anchored instruction on students' motivation to learn and if differences occurred between students with and without LD, the pretest and posttest scores of the subscales of the motivational questionnaires and achievement tests were statistically analyzed for differences between the groups using 2 X 2 factorial designs. The two independent variables were type of instruction (anchored instruction vs. non-anchored instruction) and students' characteristics (students with LD vs. students without LD). All measures were collected prior to and following the implementation of intervention. Table 3.1 shows the experimental design of this study.

Table 3.1 Research Design

Conditions / **Students**	**Anchored Instruction (n=40)**		**Non-Anchored Instruction (n=40)**	
	Pretest	**Posttest**	**Pretest**	**Posttest**
With LD (n=28)	(n = 14) MSLQ[1] SMS[2] Achievement[3]	(n = 14) MSLQ SMS Achievement	(n = 14) MSLQ SMS Achievement	(n = 14) MSLQ SMS Achievement
Without LD (n=52)	(n = 26) MSLQ SMS Achievement	(n = 26) MSLQ SMS Achievement	(n = 26) MSLQ SMS Achievement	(n = 26) MSLQ SMS Achievement

[1]MSLQ = Motivated Strategies for Learning Questionnaire; [2]SMS = Situated Motivation Survey. [3]Achievement included two tests; a curriculum-based achievement test and Test of Silent Contextual Reading Fluency.

SETTING AND PARTICIPANTS

School Context

A middle school in a suburban-metropolitan school district in central Texas served as the site of the study. The majority of the 647 students who attended the school

were from relatively low SES households. The student ratio of economically disadvantaged was 66.9% (Texas Education Agency, 2006). The student population was 67% Hispanic, 19% African American, and the remaining 14% was composed of European American (13%), Asian American/Pacific Islander (1.1%), and Native American students (0.3%). With regard to class size, the average 7th-grade language arts class contained 24.1 students. It was slightly higher than the state and district average levels, which were 20.3 and 22.6 respectively (Texas Education Agency, 2006). On the recent Texas Assessment of Knowledge and Skills (TAKS), 23% of students at this school failed the reading test. The average reading achievement score was lower than the state average level.

Students

Students who were enrolled in either of the two 7th-grade language arts teachers' classes participated in the study. The students had been randomly assigned to the classes by the school administration at the beginning of semester. Each language arts teacher taught six classes a day including one advanced placement (AP) class. The class sizes varied between 15 and 30 students per class. Each class included between three to seven students with identified LD.

A total of 141 students were enrolled in classes by taught the two teachers who agreed to participate in this study. Two AP classes were excluded in this study because the non-anchored instruction group teacher taught a different curriculum for her AP students during the experimental period. For participant comparability, the AP students in the anchored instruction group were also excluded from the data collection. A total of 65 students (72% consent ratio) from the anchored instruction group and 76 students (75% consent ratio) from the non-anchored instruction group consented to participate in this study. To compensate for the practical impossibility of random assignment due to

previously established intact classes, 40 students were randomly selected from each instructional group.

Of the total of 65 students who consented to participate in this study in the anchored instruction group, 17 students were identified LD. However, only 16 students with LD completed the pretest and posttest. To attain statistical Power (40 students per condition), 26 students without LD were randomly selected from the 65 anchored instruction student participant list. Similarly, of the total of 76 students who consented to participate in this study in the non-anchored instruction condition, 14 students were identified LD, and all of them completed the pretest and the posttest. The 26 non-LD students were randomly selected from the participant list and assigned to the non-anchored instruction group. To meet the same number of students with LD for each group, 14 students with LD were randomly selected among the 16 students in the anchored instruction condition. Finally, 14 students with LD and 26 students without LD per each instructional group were included for this study. A summary of student participants is presented in Table 3.2.

The students with identified LD in this study met the following criteria: (a) They were identified as students with LD by school district criteria for learning disabilities; (b) they performed below minimum required levels for their grade level on a measure of an achievement test in reading based on the TAKS; (c) they did not have neurological disease, chronic medical illness, or sensory deficit; and (d) they were not English Language Learners (ELL) who were enrolled in special English instructional program(s) in school. As the school did not permit access to the IEP and the criteria for students with LD, teachers identified students with LD based on their school records and aforementioned criteria.

Sample Comparability

To determine if statistically significant differences existed between experimental and comparison conditions in the characteristics of participating students prior to implementing interventions, the scores of the Test of Silent Contextual Reading Fluency **(**TOSCRF) (Hammill, Wiederholt, & Allen, 1996), Cornell Critical Thinking Test (CCTT), and a pretest score of academic achievement on the novel Nightjohn were used. The TOSCRF was used to measure basic reading fluency skills while the CCTT was useful to measure students' higher-level thinking skills (Hur, 2001). In particular, Pintrich (2003) indicated that critical thinking skills were related to motivation to learn. In addition, the pre-test score regarding the curriculum, Nightjohn, that measured students' prior content knowledge about the novel, was based on 30 multiple choice questions. Table 3.2 presents an overall summary of sample comparability.

To investigate the pretest differences between instruction conditions (anchored instruction vs. non-anchored instruction) age, CCTT, TOSCRF, and prior knowledge of the curriculum, ANOVAs were conducted. For the age, ANOVA revealed that there was no significant interaction effect between instruction condition and type of students [F (1, 76) = .88, p = .35], indicating that the age of students with and without LD were similar across the instruction condition. In addition, there was no significant difference between pretest scores of students with and without LD [F (1, 76) = .40, p = .53].

In terms of pretest CCTT, TOSCRF, and prior knowledge on the curriculum scores, the results of ANOVAs revealed that there were no significant differences between instruction conditions in CCTT [F (1, 78) = .005, p = .94], TOSCRF [F (1, 78) = .52, p = .47], and prior knowledge of the curriculum [F (1, 78) = .15, p = .70]. With regard to students with and without LD, there was significant difference between them in CCTT, F (1, 76) = 10.98, p < .01. However, there was no interaction effect between

instruction conditions by type of students [F (1, 76 = .17, p = .89], indicating that the sample of students with and without LD between instruction conditions was comparable. As expected, there was significant difference between students with and without LD in the TOSCRF score, F (1, 76) = 21.74, p < .01. However, there was no interaction effect between instruction conditions by types of students in the TOSCRF, F (1, 76) = .78, p = .38.

Table 3.2 Profiles of Students at Each Instructional Condition

Variable	Anchored Instruction			Non-Anchored Instruction		
	Without (n=26)	**With[1] (n=14)**	**Total (n=40)**	**Without (n=26)**	**With (n=14)**	**Total (n=40)**
Age: *M* (*SD*)	12.9 (.66)	12.9 (.47)	12.9 (.59)	12.8 (.54)	13.0(.73)	12.9(.61)
Gender: *n* (%)						
Male	14 (53.8)	8 (57.1)	22 (55.0)	15 (57.7)	8 (57.1)	23 (56.3)
Female	12 (46.2)	6 (42.9)	18 (45.0)	11 (42.3)	6 (42.9)	17 (43.7)
Ethnicity: *n* (%)						
African American	5 (19.3)	2 (14.3)	7 (17.5)	1 (3.8)	4 (28.6)	5 (15.0)
Asian American	1 (3.8)	1 (7.1)	2 (5.0)	0 (0.0)	0 (0.0)	0 (0.0)
European American	5 (19.3)	1 (7.1)	6 (15.0)	4 (15.4)	1 (7.1)	5 (12.5)
Hispanic	14 (53.8)	10 (71.4)	24 (60.0)	20 (76.9)	8 (57.1)	28 (70.0)
Native American	1 (3.8)	0 (0.0)	1 (2.5)	1 (3.8)	1 (3.8)	2 (5.0)
SES: *n* (%)						
Low	0 (0.0)	1 (7.1)	1 (2.5)	1 (3.8)	0 (0.0)	1 (2.5)
Low middle	9 (34.6)	5 (35.7)	14 (35.0)	3 (11.5)	3 (21.5)	6 (15.0)
Middle	9 (34.6)	2 (14.3)	11 (27.5)	13 (50.0)	8 (57.1)	21 (52.5)
Upper middle	8 (30.8)	4 (28.6)	12 (30.0)	7 (26.9)	2 (14.3)	9 (22.5)
Upper	0 (0.0)	2 (14.3)	2 (5.0)	2 (7.7)	1 (7.1)	3 (7.5)
CCTT[2]: *M* (*SD*)	7.42 (5.12)	4.03 (3.68)	6.32 (4.90)	7.59 (4.83)	3.92 (3.39)	6.31 (4.68)
TOSCRF[3]: *M* (*SD*)	95.15 (10.29)	87.57 (8.69)	92.50 (10.32)	94.84 (6.93)	83.71 (7.51)	90.95 (8.86)
Prior Knowledge on Curriculum : *M* (*SD*)	1.53 (2.19)	2.14 (2.10)	1.75 (2.15)	1.80 (1.52)	2.14 (2.56)	1.92 (1.92)

[1]With = With LD; Without = Without LD; [2]CCTT = Cornell Critical Thinking Skill Test;
[3] TOSCRF = The Test of Silent Contextual Reading Fluency

The Chi-square analysis was used to test the relationship between the instruction groups and a student's gender, ethnicity, and social economic status (SES). Pajares and Valiante (2001) demonstrated that students' gender could influence motivation to learn, particularly in the areas of reading and writing. Students' ethnicity also could influence motivational styles in school (Banks, 1993). Relative to SES, the National Research Council (2004) reported a close relationship between students' SES and their motivation to learn. For the gender, the results of a Chi-Square analysis yielded no significant difference between instruction conditions, 2 (1, N = 80) = 0.05, p = .82. The results of Chi-Square analysis also revealed no significant differences between instruction conditions and ethnicity and SES respectively, 2 (4, N = 80) = 2.76, p = .54 and 2 (4, N = 80) = .6.95, p = .14.

Teachers

Two 7th-grade English/language arts teachers participated in this study. The profiles of two teachers are presented in Table 3.3.

Table 3.3 Profiles of Teachers: Anchored Instruction vs. Non-Anchored Instruction

Category	AI	Non- AI
Gender	Female	Female
Age	30-39	30-39
Ethnicity	Hispanic	White
Teaching Experience (years)	3	7
Highest Degree Earned	MED[1]	MED
Special Education Teaching Certificate	No	No
Bilingual Education and/or ESL Teaching Certificate	Yes	No
Reading Specialist Teaching Certificate	No	Yes
Professional Development Programs for Special Education	At least 3	Less than 3

[1]MED = Master of education degree.

The two teachers were female. One was White and the other was Hispanic. They were in their mid 30's. The highest degree of the two teachers was master of education. The anchored instruction teacher's teaching experience was 3 years and the non-anchored instruction teacher's was 7 years. Both of them had previous experiences teaching anchored instruction with To Kill a Mockingbird curriculum in the preceding year. In particular, it was the anchored instruction teacher's third time to implement anchored instruction.

The non-anchored instruction teacher took more courses for understanding students with disabilities in undergraduate and graduate school than the anchored instruction teacher did, at least two and less than two respectively. However, the anchored instruction teacher took more courses about instructions for students with LD in undergraduate and graduate school than the non-anchored instruction teacher did, at least three and less than two respectively. In addition, the non-anchored instruction teacher had a reading specialist teaching certificate and the anchored instruction teacher had a bilingual education and/or teaching English as a secondary language teaching certificate.

INTERVENTION IMPLEMENTATION

This study employed multimedia-based anchored instruction in language arts that was designed and was implemented by past studies (Glaser et al., 1999;Rieth et al., 2003). In particular, with the exception of the selected novel, the intervention principles and procedures were similar to the study conducted by Rieth et al. (2003).

Description of Implementing Anchored Instruction

Teachers selected the novel Nightjohn written by Gary Paulsen (1993) as their five-week curriculum. Nightjohn was approved for use in the middle school curriculum by the school district. In addition, there was a movie that was aligned with the novel. The

movie was used as a multimedia anchor to teach students about the themes of money, power, and human relationship. These themes are one of the important themes in literacy education (Rieth et al., 2003; Scribner, 1985).

Implementing Anchored Instruction

Phase 1. The first phase was labeled "Setting the stage," and it required approximately eight days to complete. This phase included four main activities. They included learning how to: interview, conduct research, present research, and transition to the anchor. Typically, students with and without LD have difficulties in project-based learning and participating in classroom interactions (Glaser et al., 1999;Rieth et al., 2003). Therefore, the teacher focused on the activities designed to help students learn how to ask higher-level questions and to improve the critical thinking skills required to complete the tasks associated with anchored instruction. For example, in order to obtain more information, students learned to ask "why" and "how" questions rather than "what" and "when" questions. Good question asking and question answering skills are essential for successful participation in classroom discussion (Glaser et al., 1999). Knapczyk (1991) reported that the improvement of students' question-asking skills promotes reading comprehension and improves on-task performance.

A students' personal "object box" was used to teach students to conduct an interview and to ask questions. The teacher asked students to bring in boxes that contained two to four objects that best represented themselves (See Appendix A). The objects represented students' family history, their ethnicities, and relationship with others. Prior to the students' activity, the teacher modeled this activity by assembling and sharing a personal object box. Then, the teacher asked students a question, such as "What do these items tell you about me? Explain why?" During the next class, the teacher divided students into groups of three to five students and assigned individual roles as a recorder, a

question-asker, and a responder in a group. Students shared with peers their personal objects and interviewed one another about the objects. The teacher allowed approximately 10 minutes per student for questioning. Then, the teacher asked the groups to record their responses to the following questions, such as “What types of questions did you ask?” “What types of questions gave you the most information about a person? Why?” “What type of questions did not seem to give you much information? Why not?” Consequently, students described the types of questions that were most effective in obtaining detailed information about a person. This experience helped students to link classroom experiences to their personal life. Consequently, students understood the value and relevance of learning activities, which improved students’ motivation to learn (CTGV, 1992; Hickey, 1997).

To teach how to research, photos that showed the period of Nightjohn were used to expand the “object box” activity. The teacher provided a notebook of photographs to each group and asked them to generate question(s) about the photos. The photograph notebook included 21 white and black photographs that were used as anchors. They depicted the real life contexts illustrating North America slave life and how slaves were treated in the 19th century. In addition, some of them depicted the 1800s’ social and historical background knowledge, such as transportation, economy, and entertainment.

In particular, the “Slave Market” by Boulanger (1882) was used as a primary photographic anchor. It depicted a Roman slave auction and it was intended to show the horror of human beings for sale regardless of ethnicity. The teacher provided sample questions about the photograph, such as “Who are the people in this picture?” “When do you think this took place?” “How do you think the people in the photograph are feeling?” The teacher guided students to remind them of the previous “object box” activity.

Students were encouraged to generate research questions. For example, some asked, “Why were those people slaved? Why are there African Americans?” Subsequently students were allowed to answer the questions. Each group researched the era of Nightjohn, mid 1800s’, based on books or Internet search. Next, each group developed a poster board presentation. They presented their findings based on their research in creative ways including a poem, a song, or a drawing (See Appendix A). At the end of the presentation, the teacher asked each group of students what types of questions were effective or ineffective in guiding their research. Then the teacher selected a photo and asked students to think of the photo related to the themes of money, power, and human relationship. The teacher asked the group, “Who has power and money? Why?” “How was the relationship between Nightjohn and slave community?”

The teacher introduced the video anchor to exemplify how a video segment depicts the themes and times. Then, students watched a specific segment of the movie to generate questions about themes in the movie clip. After students watched the movie clip, the teacher asked, “What questions do you have about the clip?” “How were money, power, and human relationships represented in the clip?” After discussions the teacher divided the class into four groups. Each group was provided with a TV, DVD player, and DVD of Nightjohn. Student could access teachers’ computer and printer during anchored instruction to search for and print information.

Phase 2. The second phase was labeled “Watching the anchor/retelling,” and it required three days to complete. In this phase, students mainly watched the movie as an anchor. The movie provided a shared context regarding the novel and the time period. The teacher asked students to watch the movie, while keeping in mind the themes of money, power, and human relationship, and how these themes were illustrated in the movie.

Subsequent to the retelling activity, students (a) identified main characters, (b) clarified the chronological sequence of events in the movie, and (c) corrected misconceptions about movie contents based on whole-class discussion. This activity provided students an opportunity to identify the scenes and characters that were important to their understanding of the novel. Furthermore, this activity helped students to generate strategies for solving problems and addressing issues presented in the movie; consequently, they could develop clearer concepts and ideas about the novel.

The students worked as a large group with the teacher to orally retell, in their own words, events that occurred in the movie. Then, the teacher divided students into three or four large groups with no more than 10 students in each group to record their retelling comments on sentence strips. The teacher assigned a portion of the movie to each group and each group displayed their sentence strips for all the groups to discuss. The teacher added events or re-arranged the sentence strips based on the sequence of the movie, and posted them on the wall (See Appendix A).

Phase 3. The third phase was labeled "Segmenting," and it required about three or four days to complete. The segmenting activity was defined as breaking the movie anchor into meaningful units or scenes. It was designed to develop shared expertise regarding the anchor (McLarty et al., 1990). Therefore, students segmented the movie anchor into short meaningful scenes that helped familiarize them with the movie content. Students identified scenes from the movie that best illustrated the movie's characters in terms of the themes of money, power, and human relationship.

Initially, the teacher modeled segmenting by choosing a scene that illustrated an example of the aforementioned themes. For example, the teacher provided a scene that depicts how an African American without power was treated and how human relationships were influenced by power and money in the mid 1800s.

Then, the teacher divided students into groups of three to four with a DVD player and asked each group to label a selected scene(s) as memorable and recorded the exact position of the scene in the movie based on DVD timer. Scenes were to reflect themes and the labels were to be specific and not too general. After conducting segmenting activities, each group presented their favorite scene(s) and findings based on the themes of money, power, and human relationships to classmates (See Appendix A).

Phase 4. The fourth phase was labeled "Characterization," and it required three days to complete. Characterization was designed as identifying "characters' basic personal traits and the social influences that shaped the characters' personality and reactions" (Glaser, Rieth, Kinzer, & Peter, 1999). Characterization involved describing a variety of qualities of a character. They included appearance, age, gender, educational level, occupation, economic status, social status, ambitions, beliefs, fears, emotions, motivations, and personality.

In this phase, small groups of approximately five students selected one character in the movie to analyze in great detail. They analyzed the character(s) based on the themes of power, money, human relationships, quality, and the most important scenes. The most important scenes were used as evidence to support results of their character analysis.

The teacher modeled how to create a character web and how to find the most important scenes. Then, the teacher asked questions based on one of the characters, such as "Does she have power? Why or why not? What evidence in the movie do you have of this?" As a product of this phase, each group created a character web based on the teacher modeling. The teacher provided Inspiration software to create a character web. Subsequently, they presented their character web to classmates. The teacher evaluated and provides feedback to each group based on how appropriately the scenes they selected

support their character web, and whether they analyzed characters in great detail including different qualities, relationships, power, and important scenes (See Appendix A).

Phase 5. The fifth phase was labeled "Student research and presentations," and it required approximately three to four days to complete. In this phase, students participated in a cooperative research activity, designed to improve their in-depth understanding of the novel's content and their implication (Glaser, Rieth, Kinzer, & Peter, 1999). The teacher's role was that of a facilitator who coaches and scaffolds students. The teacher provided guides for research strategies including appropriate research question development skills and information located on the Internet and in books. In addition, the teacher reviewed students' knowledge and expertise acquired during the previous phases, such as detailed novel contents and good question-asking skills to guide research activity. Students used the school library and computer labs for the research activities. Students could access the Internet, books, and application programs including MS Word, Inspiration, and PowerPoint. The teacher also provided support for students' use of technology to develop their presentations.

Initially, students were divided into small groups of four to five. Each group identified the important issues in the novel to develop a group research question. Students used books and Internet resources to develop a research question. The teacher facilitated each group as they developed a research question, closely related to the themes of the novel.

Students visited the school library to collect information from books to answer their research question. The teacher provided examples of a few useful websites to guide students' Internet search and PowerPoint development. After each group completed their research, they were provided an opportunity to present their research findings to

classmates. Students used PowerPoint or a poster board to present their findings (See Appendix A).

Description of Implementing Non-anchored Instruction

The teacher in the comparison condition taught the same novel as in the classes taught using anchored instruction. This non-anchored instruction classes mainly consisted of three phases, including the provision of prior knowledge about Nightjohn, group reading of the novel, and watching the movie as a group.

At the beginning day of the five-week curriculum, the teacher provided each student with a packet containing a list of five-weeks worth of activities, including background information sheets about the slavery system, worksheets for daily class activities, homework, and reading log. The teacher spent three consecutive classes introducing students to the main themes contained in Nighjohn. During these classes, she provided students with background knowledge about the slavery system before they read the novel. She discussed with the whole class the value of freedom, human's beliefs, bravery and survival, helping each other, race and freedom, humans as property, and reading and writing as essential skills. She provided 10 guided statements describing themes and prior knowledge. For example, she provided a statement "property owners have the right to treat their property as they wish." Individual students were asked to defend their opinions with a rationale.

Then, the teacher taught background knowledge on slavery in the United States, including when, why and how the North America slavery system was established and how the slaves were treated. She showed a world map to explain the Slave Trade Triangle, including a transportation route on the map. In addition, she also taught information about Civil War and Sally Hermmings related to Nightjohn. Based on this information, students shared their ideas on the slavery system and slaves' lives as a small

group. As a product, each group listed the words that described or characterized slavery. For example, one group listed words, such as “no freedom, black codes, poverty, slaves were owned, no independence, discrimination, deprivation, lots of people got beat, were not pay as well as others, not able to have equal rights, KKK, were not allowed to vote.” As a last activity before reading a book, the teacher discussed the value of literacy and the main themes of Nightjohn. Students shared their interesting reading and brainstormed the value of reading and writing.

The second main phase was reading Nightjohn chapter by chapter. Typically, the teacher used an audio book to accomplish the task. Students read silently while listening to an audio book. Sometimes, the teacher read a part of a chapter aloud. The objective of listening to an audio book was to promote active listening skills and to comprehend the story. After completing the audio book, the teacher implemented a variety of vocabulary lessons, including an individual worksheet activity, a team-based whole class vocabulary game, and a crossword puzzle. Following vocabulary lesson, students had opportunities to express their impressions orally based on given discussion questions. For example, teachers asked questions like “How did this chapter make you feel? Why? Why do you think the writer makes the reader feel like this?” “If you could speak to Clel Waller, what advice would you give him in order to protect his slaves?” “Why do you think Nightjohn chose Sarny?” Then, the teacher asked the whole class questions about the novel including plot, point of view, characters, character attributes, setting, foreshadowing, and dialect. In addition, the teacher discussed the themes of money, freedom, power, and human relationship with the evidences described in the chapters. Students worked as a small group to find evidences for each theme before whole class discussion. For example, one group of students provided evidence of power with the quotes “slaves had to eat out,” “they called Waller a master” and “they had to stand up.”

Teachers conducted a vocabulary quiz or word puzzle after completing each chapter. After chapter four, she administrated a comprehensive quiz covering chapters that included the following types of questions; matching vocabulary, matching characters, and recalling events. In addition, the teacher included higher-level of questions about Nightjohn, such as, “Why did the master whip Alice? Why did Sarney see this as especially cruel?” “What did Sarney mean when she said that it is wrong to run?” and “Why did Nightjohn return to the South plantation after escaping to freedom in the North?” She posted the results of quiz on the classroom wall. After reading chapter three, she also provided students with a video, so they could gain a perspective on current world-wide literacy issues with Oprah Winfrey’s “School in Africa.” Regularly, students had the opportunity to recall the important events and characters after completing each chapter. As a product, students developed a novel flow chart to depict the important events sequentially.

The last phase was involved watching the movie Nightjohn in order to compare it with the book. After students completed both activates, they had the whole class discussion about the differences between the book and the movie including, plot, characters, events, and their impressions.

Interestingly, the non-anchored instruction teacher employed an instant reinforcement strategy with a coupon that can be exchanged with small items, such as a pencil and candy to encourage students’ active participation into class activities. She used this strategy when a student responded well at a whole class discussion, when a small group produced a good product, and when individual students did well on the worksheet. In addition, she used this study to promote students’ higher level of thinking skills. She gave each student one to three coupons based on student’s response level. Subsequently, students’ participation into a whole class discussion was high.

In summary, the results of 12 classroom observations implemented over the experimental period (See Appendix B), the non-anchored instruction arts classes were proportionally based on: (a) whole-class discussion, (b) students' independent silent reading based on an audio book, (c) lecture, (d) individual written seatwork, and (e) small group activity.

Intervention Fidelity of Anchored Instruction

To accurately access the effects of anchored instruction, anchored instruction requires a high level of implementation fidelity, as it provides evidence that the intervention was implemented as planned. Low implementation fidelity makes it impossible to conclude that the effects of the anchored instruction were solely due to the intervention. There are three methods to improve implementation fidelity in natural classroom-based intervention. They include providing a teacher with a one-day training workshop, lesson plans for implementation (or a manual), and an implementation fidelity checklist based on in-site observation (Gresham, MacMillan, Beebe-Frankenberger, & Bocian, 2000).

In this study, as the anchored instruction teacher had implemented anchored instruction with the high fidelity during the last two consecutive semesters, she did not require a training workshop. However, she helped develop the lesson plans before implementing the anchored instruction for about two months. The lesson planning substantially improved her understanding of the anchored instruction, and consequently, this opportunity contributed to ensuring the high implementation fidelity level.

To achieve a high level of implementation fidelity, the teacher followed day-by-day lesson plan. Each lesson plan included the objectives of each day's activity, required materials, highly detailed implementation procedures, expected student product samples, student evaluation tools and a rubric, useful websites, and the expected teacher's roles.

Weekly observations were conducted to verify intervention fidelity. An observation protocol was developed (See Appendix C), incorporating all instructional activities that were supposed to occur based on a developed lesson plan. The observation protocol also included the amount of students' engagement and responses, and the extent of their participation in classroom activities.

To develop the observation protocol, the researcher and another doctoral graduate student reviewed and discussed teachers' planned instructional activities that were described on the day-by-day lesson plan. The intervention fidelity checklist was developed based on daily activities described on the lesson plan. The fidelity checklist included four categories. They were "NA", "Yes", "No", and "students' engagement level." NA was defined as not applicable, and it was recorded when the planned activities had been already implemented during the previous class or would be implemented during the next class due to a change in the instruction schedule. "Yes" was coded when the planned activity was implemented for sufficient time. "No" meant not only that the planned activity was not implemented but also that the duration was short of the time to the lesson was planned, less by 1/3. Students' engagement level ranged from 1 to 3. "1" was defined as more than 1/2 of students were engaged in off-topic conversations with peers or staring out the window etc. "2" was defined as more than half of the students were actively engaged in the learning activity. "3" was defined as almost all of the students were actively engaged in the learning activity. After reviewing and discussing intervention fidelity checklist, two observers independently observed anchored instruction classes to record teachers' activities.

Observer Training

To ensure that reliable observation data was collected on the intervention fidelity, observers were trained for two weeks before beginning classroom observations. To

calculate inter-observer reliability, two observers independently coded data. Inter-observer agreement was calculated as agreements / (agreements + disagreements). Once the reliability was calculated, both observers discuss all disagreements. This process was repeated till inter-observer reliability reached more than 80%. When the reliability reached more than 80%, data collection on implementation fidelity was collected in the classroom. To control for observer drift, there was repeat observer trainings after two weeks observations (Bjork & Richardson-Klavhen, 1989). Finally, to calculate inter-observer reliability every phase, another doctoral graduate student observed a same class.

Results of Implementation Fidelity, Engagement, and Inter-observer Reliability

The average inter-observer reliability for the implementation fidelity checklist and engagement level by phases was 91.8% and 92.5% respectively. They were well above the 80% agreements seemed to acceptable inter-observer reliability. The overall summary of implementation fidelity and students' engagement level during the anchored instruction condition is presented in Table 3.4. The overall average implementation fidelity of anchored instruction was high, 91.9%. The average student engagement level during anchored instruction was 2.83, indicating that students were highly engaged in anchored instruction. In particular, the engagement level during phase 3 was the highest.

Table 3.4 Implementation Fidelity and Student Engagement for Five Phases

			Inter-observer reliability	
Phase	**Fidelity (%)**	**Engagement (*M*)**	**Fidelity (%)**	**Engagement (%)**
Phase 1	92.18	2.73	91.7	87.5
Phase 2	100.00	3.00	93.2	100
Phase 3	92.95	2.60	92.3	86.1
Phase 4	91.67	3.00	91.1	100
Phase 5	82.69	2.84	90.2	88.9
Average	**91.90**	**2.83**	**91.8**	**92.5**

MEASURES

To answer the three research questions, two measures were employed in this study. They include (a) two standardized self-report questionnaires measuring motivation to learn and (b) two academic achievement tests designed to examine the effects of anchored instruction on academic achievement and to investigate the relationship between motivation level and academic achievement on Nightjohn. Table 3.5 presents the summary of measures employed in this study.

Table 3.5 Summary of Measures

Measures (Scoring)	**2nd order subscales**	**1st order Subscales**
MSLQ (Summing the all items and taking the average. Scores range from 1-7)	Intrinsic Goal Orientation	NA
	Extrinsic Goal Orientation	
	Task Value	
	Control of Learning Beliefs	
	Self-efficacy for Learning and Performance	
	Test Anxiety	
	Peer Learning	
SMS (Summing all items and taking the average. Scores range from 1-5)	Task Appraisal	Subjective competence Relevance Interestingness
	Task Specific Motivation Orientation	Learning Performance Work avoidance1 Work avoidance2
	Strategy Activity	Surface-level Individual cognitive Distributed cognitive1 Distributed cognitive2
Curriculum-Based Achievement Test on Nightjohn (Summing the all correct	Recall of Detailed Information	NA
	Comprehension of Themes and Characters	NA
	Comprehension of	NA

answers. Scores range from 0-10 per part)	Historical/Social Contexts	
TOSCRF (Standard score based on chronological age)	NA	NA

Standardized Self-report Questionnaire Measures

Two types of self-report questionnaire measures were chosen to complement each other (See Appendix D), as multiple measures are one of the good quality indicators of an experimental study (Odom et al., 2005). Horner and Sugai (2005) and Morgan and Fuchs (2007) argued that multiple measures can provide broader validation of interventions with participants in school.

Two student self-report questionnaires were selected based on different theoretical foci. The Motivated Strategies for Learning Questionnaire (MSLQ) which has a theoretical foundation in the social cognition in aspect of motivation (Pintrich, Smith, Garcia, & McKeachie, 1991). The second is the Situated Motivation Survey (SMS) that has been developed to measure a student's motivation to learn in a constructivist-based instructional system. However, both approaches commonly assume that students' motivation to learn is contextualized and situation-specific, not generalized individual differences including self-esteem, self-concept, and self-worth (Duncan & McKeachie, 2005; Linnenbrink & Pintrich, 2003; Seegers & Boekaerts, 1993). Consequently, Hickey (1998) and Duncan and McKeachie (2005) argued that these approaches are more sensitive to measuring the impact of constructivist instructional interventions on students' motivation to learn.

Motivated Strategies for Learning Questionnaire

One of the measures employed in this study was the MSLQ (Pintrich, Smith, Garcia, & McKeachie, 1991). Originally, the MSLQ was designed to assess college

students' motivational orientation and their use of learning strategies. However, the MSLQ has been formed to be appropriate for a variety of students ranging in age from elementary to college students, in different academic areas (Duncan & McKeachie, 2005). For example, Brookhart and Durkin (2003) and Neber and Heller (2002) employed the MSLQ to measure high school students' motivation to learn in social studies, mathematics, and summer programs for gifted students. Other studies (e.g., Eom & Reiser, 2000) used it to measure junior high school students' motivation to learn. In terms of students with LD, Pintrich et al. (1994) used MSLQ for elementary students with LD.

The MSLQ includes 81 items. The items are presented as a simple statement that reflected students' attitudes and behaviors (See Appendix D). For example, there are items like, "In a class like this, I prefer class material that really challenges me so I can learn new things." "I think the class material in this class is useful for me to learn." It uses a seven point Likert scale ranging from "not at all true of me" to "very true of me." The instrument takes approximately 20-30 minutes to complete. It contains two sections: a motivation section and a learning strategies section. Since this study investigated the impact of anchored instruction on motivation to learn, the motivation section was employed. Pintrich et al. (1991) indicated that all the subscales on the MSLQ could be used either together or individually, as the scales were designed to be modular. The motivation section includes 34 items, and it takes 10-15 minutes to complete. This section contains the six subscales including goal orientation, task value, control of learning beliefs, self-efficacy for learning and performance, test anxiety, and peer learning.

In terms of meaning and reliability of each subscale, as the MSLQ was designed to be modular, Pintrich et al. (1991) reported the coefficient alphas of each motivation

subscale. *Task value* refers to the students' evaluation of how interesting, how important, and how useful the given task is. The reliability (Cronbach's alpha) of task value is .90. *Self-efficacy* refers to a self-appraisal of one's ability to master a task. It involves judgments about one's ability to accomplish a task, as well as one's confidence in one's skills to perform that task. The reliability of self-efficacy for learning and performance is .93. *Test anxiety* refers to students' worry and concerns over taking exams. The reliability of test anxiety is .80. *Peer learning* is about students' perceptions of collaborative learning. The reliability of peer learning is .76. *Goal orientation* refers to the student's perception of the reasons why he/she is engaging in a learning task, including intrinsic and extrinsic goal orientation. The *intrinsic goal orientation* includes challenge, curiosity, and mastery. The *extrinsic goal orientation* includes rewards, grades, and comparing one's performance to that of others. The reliability of intrinsic goal orientation is .74 and that of extrinsic goal orientation is .62. *Control for learning beliefs* refer to students' beliefs that their efforts to learn will result in positive outcomes. It concerns the belief that outcomes are contingent on one's own effort, in contrast to external factors such as luck and the teacher. The reliability of control for learning beliefs is .68.

Relative to the validity of the MSLQ, Pintrich et al. (1991) implemented a comprehensive statistically analysis to asses the validity of the MSLQ with 356 samples. They analyzed the predictive validity based on the correlation between the MSLQ subscales and students' final course grades. The results demonstrated promising predictive validity of MSLQ. In particular, the motivational scales showed significant correlations with the final grade with the exception of extrinsic goal orientation. In addition, the correlations were in the expected direction. For example, students who had higher intrinsic goal orientation, who believed that their class was interesting and

important, who had higher self-efficacy belief for accomplishing the tasks, and who rated themselves as in control of their learning achieved better course grades.

In addition, they assessed the validity of the MSLQ based on a confirmatory factor analysis for the set of motivation items. The results from the factor analysis reported that the average Lambda-ksi estimates were .68. This implies that the six motivational subscales were relatively highly valid for assessing students' motivation to learn.

Situated Motivation Survey

Reflecting the increased emphasis on situation-specific conceptualizations of motivation (Hickey, 1997; Paris & Turner, 1994) and the need for alternative measures based on a constructivist approach to motivation to learn, another instrument that is more specific to learning contexts or situations was used (Boekaerts, 1987; Seegers & Boekaerts, 1993).

This instrument is a 38-item activity questionnaire based on a five-point Likert scale ranging from "strongly disagree" to "strongly agree." It includes subscales that assess task-appraisal, task-specific motivation orientation, and strategic activities (e.g., "I suggested a lot to finish quickly"). *Task appraisal* measures personal perceptions of subjective competence, relevance, and the interestingness of the tasks and activities (e.g., "What I was learning was very important to me"). Measuring the task appraisals of students with LD is valuable considering the results of a study (Harts, 1997) indicating that students with LD had a tendency to be overwhelmed by learner-centered, project-based learning. The reliability of the task appraisals reported by Hickey (1996) is .66 (Cronbach's alpha). *Task-specific motivation orientation* measures whether learning orientation or performance orientation drives students' activities. In addition, it measures the tendency toward *work avoidance*. The reliability of each subscale is .86 (*learning*

orientation), .80 (*performance orientation*), .63 (*work avoidance1*), and .45 (*work avoidance2*). In contrast, the *strategy activity* assesses the level of task related engagement in different types of strategic activities while completing a task. This scale includes *individual cognitive activity* (.77), *distributed cognitive activity 1* (.73), *distributed cognitive activity 2* (.66), and surface-level activity (.76).

In terms of validity, this instrument was developed and validated to measure the effects of a constructivist approach to mathematics education (Hickey, 1996): Jasper Woodbury anchored instruction (CGTV, 1992). In addition, the subscales were validated by factor analysis based on 331 samples (Hickey, 1996).

Achievement Tests

Curriculum-Based Achievement Test

A curriculum-based achievement test on the novel aligned with the curriculum of Nightjohn was developed. It was viewed as a more sensitive way than a standardized test to examine the effects of short term intervention (Thurber, Shinn, & Smolkowski, 2002). It consisted of a 50-item multiple-choice test about the novel Nightjohn. The test items mainly assessed three categories: (a) recall of detailed information about the novel (e.g., main characters and important events), (b) comprehension of main themes and characters presented in the novel, and (c) understanding of the historical/social contexts of the novel. Two participating 7th-grade teachers independently reviewed the validity of the developed 50 items, and they rated each item's relevance of categorization and level of difficulty (Appendix E). In addition, they reviewed whether each item was an adequate sample of the domain of content they taught about the novel Nightjohn. The between-teachers agreement level was 91.3% about the 50 items.

To control for possible bias favoring one of the instructional conditions, 40 items that both teachers agreed as representative of their curriculum were selected. To increase the reliability of test, a 40 item analysis was conducted after the posttest. Based on the results of the item analysis, the only items that contributed to a high reliability level were selected. Consequently, a total of were 30 items, 10 items per category, were used for data analysis (Appendix F). In terms of the between-teacher agreement level was 95.1% for the 30 items selected. Each score was based on the three categories used to analyze the effects of instructions on achievement. In addition, these scores were used to calculate the correlation coefficient between level of motivation to learn and achievement.

Test of Silent Contextual Reading Fluency

TOSCRF assessed the silent reading ability, including word identification, word meaning, word building, sentence structure, comprehension, and fluency (Hammill, Wiederholt, & Allen, 1996). It measures the speed with which students can recognize each word in a printed passage without punctuation or spaces between words. This test was normed on a nationally representative sample. It can asses the reading fluency of students aged 7 to 18 years-old. This test provides raw scores, standard scores, percentiles, and age and grade equivalents. This study employed the standard scores to investigate the effects of anchored instruction. The reliability coefficient was .84.

In terms of validity, TOSCRF indicated the close relationship with other standardized tests. For example, the coefficients with Global Reading, Stanford 9 total reading, GORT-4 total score were large, .70, .68, and .67 respectively. TOSCRF also yielded large coefficient with measures of school achievement. For example, the coefficients between TOSCRF and Stanford 9 vocabulary, WJ-III: Spelling, and WJ-III academic skills are .56, .76, and .68 respectively.

PROCEDURES AND DATA COLLECTION

After acquiring permission from the institutional review board (IRB), two 7th grade language arts teachers volunteered to participate in this study. Students were selected using convenience sampling based on the availability of parents consent. The experimental group received anchored instruction as the treatment.

Two weeks before implementing the intervention, the students' self-report questionnaires and academic achievement tests data were collected. After the pretests were administrated, students in experimental conditions received anchored instruction for about an one-hour every day for five weeks. While the anchored instruction was designed as a six-week program, the intervention schedule conflicted with the state-wide knowledge assessment schedule, so only five weeks were available for implementing anchored instruction. The sequences of assessment and instruction are graphically depicted in Table 3.6.

Table 3.6 Data Collection Procedures

Pre Intervention	**Intervention (5 weeks)**					**Post Intervention**
2 Weeks before intervention	P[1]1	P2	P3	P4	P5	After intervention
Pre-tests MSLQ SMS Achievement - Curriculum-based test - TOSCRF	Observation Intervention fidelity Teaching behaviors					Post-tests MSLQ SMS Achievement - Curriculum-based test - TOSCRF

[1]P = Phases in anchored instruction.

The control group teacher taught the same novel in her usual manner. During the instruction phases, the classroom observation was implemented for the randomly selected more than 10 classes per each condition to collect implementation fidelity data for the

anchored instruction condition and to observe two teachers' teaching behaviors. After finishing instructions, the same data collection of self-report questionnaire measures and academic achievement was conducted.

DATA ANALYSIS

To investigate the effects of anchored instruction on motivation to learn, several statistical analysis were performed using scores from the MSLQ, SMS, and two achievement tests; a curriculum-based achievement test and TOSCRF. Each of the four sets of scores was examined separately using a 2 X 2 between-group design. Motivational data were analyzed with a doubly multivariate repeated measure analysis of variance (MANOVA) with treatment (anchored instruction vs. non-anchored instruction) and student (students with LD vs. students without LD) as between-subjects factors and time (pretest vs. posttest) as a within-subjects factor. To investigate the effects on the curriculum-based achievement and TOSCRF, MANCOVA and ANCOVA respectively were performed using pretest score as a covariate. The significant level was set a priori at $p = .05$.

To investigate the differences between students with and without LD in motivation to learn language arts, MANOVA and subsequent ANOVAs were conducted with students' MSLQ and SMS pretest data that exclude the intervention effects. To analyze the relationships between improved motivation to learn and academic achievement of students with and those without LD, the motivation data and the curriculum-based achievement data were used to produce a zero-order correlation coefficient (r).

CHAPTER IV

Results

This chapter consists of four sections: (a) effects of anchored- and non-anchored instructions on MSLQ and SMS measures based on between-groups comparisons and within-group comparisons, (b) effects of anchored- and non-anchored instructions on scores earned on two achievement tests, (c) motivational differences between students with and without LD, and (d) the relationship between level of motivation to learn and the level of achievement. All of four sections included the results for analysis on the differences between students with and without LD.

The preliminary and subsequent analyses carried out using scores from the Motivated Strategies for Learning Questionnaire (MSLQ), Situated Motivation Survey (SMS), and two achievement tests; a curriculum-based achievement test and Test of Silent Contextual Reading Fluency; TOSCRF. Each of the four sets of scores was examined separately using a 2 X 2 between-group design. Motivational data were analyzed with a doubly multivariate repeated measure analysis of variance (MANOVA) with treatment (anchored instruction vs. non-anchored instruction) and student (students with LD vs. students without LD) as between-subjects factors and time (pretest vs. posttest) as a within-subjects factor. To investigate the effects on the curriculum-based achievement and TOSCRF, MANCOVA and ANCOVA respectively were calculated using pretest score as a covariate.

All measures were collected, immediately prior to implementing the intervention and following the intervention. A statically significant alpha level was set, a priori, at .05. Considering the limitations, especially the strong dependence on sample size, associated with significance testing and *p*-values as the sole criterion for interpreting the meaning of

results (American Psychological Association, 2001), partial eta-squared (η^2) was used as the estimate of effect size, which shows the magnitude of effects or how large the difference between groups that is relatively independent of sample size. Partial eta-squared was used instead of eta-squared because it is one of the most useful estimate that statistical software reports. The partial eta-squared is defined as the proportions of total variation attributable to the factor, excluding other factors from the total nonerror variation (Cohen, 1986), indicating the strength of association between impendent variables and dependent variables. This partial eta-squared in multifactor ANOVA is typically greater than classical eta-squared because some of the nonerror variation can be accounted for by other factors in the analysis (Pierce, Block, & Aguinis, 2004)). Partial eta-squared values range from 0 to 1. Generally, the larger the effect size, the greater is the impact of an intervention. Partial eta-squared can be interpreted as small (0.01), medium (0.06), and large (0.14) (Stevens, 1996). In addition, preliminary assumption tests were conducted to investigate the multivariate normality and homogeneity of variance of each measure for MANOVA. In terms of ANCOVA and MANCOVA, the homogeneity of regressions assumption test was performed for a covariate.

EFFECTS ON MOTIVATED STRATEGIES FOR LEARNING QUESTIONNAIRE

Multivariate Assumption Tests

Preliminary assumption tests were conducted to ensure that there was no violation of the assumptions of multivariate homogeneity and normality of variance.

Homogeneity of Variance

To investigate if MSLQ data violates the multivariate equivalent of homogeneity of variance assumption, Box's Test of Equality Covariance Matrices was analyzed. This test assumes that the variance/covariance matrix in each cell of the design is sampled

from the same population. In particular, when the sample sizes are unequal, this test of assumption evaluates Box's M test at alpha < .001. If the significant value is larger than .001, it means that the data have not violated the assumption (Tabachnick & Fidell, 1996). For the MSLQ data, the Box's M' significant values (Box's M = 194.390, F = 1.292, df = 105, 1188.490, p = .025) were larger than .001. Therefore the MSLQ data have not violated this assumption.

Levene's Test was also employed to investigate if the data violates the assumption of equality of error variances for variables. This tests the null hypothesis that the error variance of the dependent variable is equal across groups. The test results are presented in Table 4.1. As none of the variables recorded significant vales at .05, the data can be assumed equal variances across the groups. Therefore, no MSLQ data violated this assumption.

Table 4.1 Levene's Test for MSLQ Pretest and Posttest

Variable	**Testing time**	***F***	***df1***	***df2***	***p***
Intrinsic goal orientation	Pretest	.97	3	76	.40
	Posttest	1.51	3	76	.21
Extrinsic goal orientation	Pretest	2.49	3	76	.06
	Posttest	1.69	3	76	.17
Task Value	Pretest	2.42	3	76	.07
	Posttest	.53	3	76	.65
Control Beliefs	Pretest	.15	3	76	.92
	Posttest	.54	3	76	.65
Self-efficacy	Pretest	1.43	3	76	.24
	Posttest	.34	3	76	.79
Test Anxiety	Pretest	2.64	3	76	.06
	Posttest	1.75	3	76	.16
Peer Learning	Pretest	.45	3	76	.71
	Posttest	.74	3	76	.52

Multivariate Normality

To test multivariate normality, data skewness and kurtosis were examined. Skewness should be within the +2 to -2 range when the data are normally distributed. Kurtosis also should be within the +2 to -2 range when the data are normally distributed. As indicated in Table 4.2, no data were out of range in skewness. The majority of scales indicated negative values for the skewness, indicating that data were skewed left. Most of the kurtosis values also were negative, indicating a relatively flat distribution of data.

Table 4.2 Summary of Normality Assumption Tests

Scale		**Skewness**		**Kurtosis**		**Descriptive Statistics**	
		Statistic	***SE***	**Statistic**	***SE***	**Mean**	***Median***
Intrinsic Goal Orientation	Pretest	-.41	.26	.017	.53	4.58	4.75
	Posttest	-.62	.26	.02	.53	4.70	5.00
Extrinsic Goal Orientation	Pretest	-1.38	.26	2.62	.53	5.58	5.75
	Posttest	-.50	.26	-.27	.53	5.32	5.50
Task Value	Pretest	-.76	.26	.78	.53	4.80	4.83
	Posttest	-.69	.26	-.11	.53	5.07	5.14
Control Beliefs	Pretest	-.31	.26	-.64	.53	4.85	5.00
	Posttest	-.23	.26	-.67	.53	4.94	5.00
Self-efficacy	Pretest	-.10	.26	-.73	.53	5.16	5.25
	Posttest	-.50	.26	1.16	.53	5.12	5.19
Test Anxiety	Pretest	-.04	.26	-.96	.53	3.87	4.10
	Posttest	-.07	.26	-.76	.53	3.86	4.00
Peer Learning	Pretest	.11	.26	-.35	.53	3.93	4.00
	Posttest	.11	.26	-.48	.53	4.11	4.16

However, the pretest data in extrinsic goal orientation was 2.6 at the kurtosis. In addition, the results of Shapiro-Wilk also indicated that intrinsic goal orientation and extrinsic goal orientation data violated the multivariate normality assumption at the .05

significant level. However, many studies (Glass, Peckham, & Sanders, 1972; Stevens, 1996) demonstrated that non-normality had a small effect on the actual alpha level and power. Pallant (2004) indicated that although the significance tests of MANOVA are based on the multivariate normal distribution, in practice it is reasonably robust to modest violations of normality.

Between-Groups Comparisons of MSLQ

A 2 x 2 x 2 doubly MANOVA was performed on the results of MSLQ as self-assessed by the students prior to the intervention and following the intervention. This design is powerful because error variance is reduced substantially (Shaughnessy & Zechmeister, 1990). The two independent variables were class (anchored and non-anchored instruction classes) and student (students with and without LD). The within-subjects factor was time (e.g., the pretest and posttest of MSLQ). Multivariate *F* ratios were generated from Pillai's trace in stead of Wilk's lambda because Pillai's trace is more robust for multivariate tests when the data has relatively small sample size and unequal n vales (Tabachinick & Fidell, 1996). The descriptive statistics for MSLQ are presented in Table 4.3.

As the primary interest is the question of which groups changed in motivation to learn, Time X Class X Student, Time X Class, and Time X Student are examined. As Table 4.4 indicated, only Time X Class was significant [(F (3, 70) = 3.88, p <.01)], indicating that a significant difference in change between pretest and posttest scores in the MSLQ for the two experimental groups. The difference could be attributed to the students' presence in different classes because students who participated in anchored instruction and who did not participated in anchored instruction showed a significant difference. The partial effect size (η^2) was .28 and the observed power was .97, supporting strong effect of anchored instruction.

Table 4.3 Descriptive Statistics for MSLQ Pretest and Posttest Scores

Variable (subscale)		Anchored Instruction			No-anchored Instruction		
		Without LD	With LD	with and without LD	Without LD	With LD	with and without LD
		M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
Intrinsic Goal Orientation	Pre	4.93 (.98)	4.21 (1.12)	4.68 (1.08)	4.32 (1.30)	4.8036 (1.20)	4.49 (1.27)
	Post	4.77 (1.11)	4.73 (1.04)	4.76 (1.07)	4.57 (1.16)	4.75 (1.66)	4.63 (1.34)
Extrinsic Goal Orientation	Pre	5.87 (.81)	5.60 (1.46)	5.78 (1.07)	5.28 (1.38)	5.57 (.94)	5.38 (1.24)
	Post	5.36 (1.16)	5.51 (.85)	5.41 (1.05)	5.26 (1.13)	5.14 (1.46)	5.22 (1.24)
Task Value	Pre	4.93 (.96)	4.62 (1.42)	4.82 (1.13)	4.76 (1.44)	4.81 (.72)	4.78 (1.22)
	Post	5.42 (1.21)	5.25 (.88)	5.36 (1.10)	4.76 (1.22)	4.79 (1.29)	4.77 (1.23)
Control Beliefs	Pre	4.92 (1.24)	4.87 (1.31)	4.90 (1.25)	4.74 (1.29)	4.94 (1.21)	4.81 (1.25)
	Post	5.28 (1.17)	4.78 (1.32)	5.11 (1.23)	4.75 (1.10)	4.82 (1.34)	4.78 (1.17)
Self-efficacy	Pre	5.22 (.752)	5.13 (.66)	5.19 (.71)	5.14 (.94)	5.12 (.80)	5.13 (.88)
	Post	5.39 (.90)	4.94 (.76)	5.23 (.87)	4.99 (1.06)	5.06 (1.01)	5.02 (1.03)
Test Anxiety	Pre	4.11 (1.49)	3.95 (2.12)	4.06 (1.71)	3.48 (1.44)	4.04 (1.51)	3.68 (1.47)
	Post	3.78 (1.13)	3.67 (1.68)	3.74 (1.32)	3.94 (1.36)	4.05 (1.43)	3.98 (1.36)
Peer Learning	Pre	4.03 (1.25)	3.84 (1.44)	3.96 (1.30)	3.76 (1.46)	4.16 (1.26)	3.90 (1.39)
	Post	4.42 (1.04)	4.45 (1.18)	4.43 (1.08)	3.70 (1.36)	3.96 (1.43)	3.79 (1.37)

With regard to the comparison between students with and without LD, the Time X Student result was not significant [(F (7, 70) = .031, p = 0.94)], indicating that the motivation to learn did not change differently from the pretest prior to the intervention until after the intervention period on the basis of students with and without LD. It

suggested that students with and without LD experienced similar motivational changes during the study. It addition, there was no significant interaction between the instructional conditions, the time effect, and type of student, F (7, 70) = 1.15, p = .34, indicating that the MSLQ scores of students with and without LD did not change significantly differently based on the instruction conditions over time.

Table 4.4 Multivariate Repeated Measures MANOVA Results from the MSLQ

Source	F^1	*df*	*Error df*	*p*	$\eta 2$	Power
Time	2.68**	7	70	.00	.21	.87
Time X Class	3.88**	7	70	.00	.28	.97
Time X Student	.31	7	70	.94	.03	.13
Time X Class X Student	1.15	7	70	.34	.10	.46

[1]Multivariate *F* ratios were generated from Pillai's trace; [2] $\eta 2$ = Partial Eta-squared; Class = Anchored instruction and non-anchored instruction conditions, Student = Students with and without LD; ** $p < .01$ and * $p < .05$; statistical significance level at the either 0.05 or 0.01 level (2-tailed).

As there was a significant result on the multivariate test for Time X Class, the follow up univariate analysis compared the anchored instruction and control groups for the each of dependent variables. As presented in Table 4.5, when the results for the dependent variables were considered separately, one subscale reached statistical significance, Peer Learning (F (1, 76) = 19.32, $p < .01$). A pairwise comparison of the mean scores which was adjusted for multiple comparisons from Bonferroni indicated that students in anchored instruction reported higher levels of peer learning (mean difference=.289, SE=.298) than the non-anchored instruction students did.

Table 4.5 Univariate Analysis of Variance for Time X Class for MSLQ Measures

Variable	**Type III *SS***	***MS***	***F*[1]**	***p***	***η2***	**Power**
Intrinsic Goal Orientation	.06	.06	.07	.791	.001	.05
Extrinsic Goal Orientation	.05	.05	.04	.826	.001	.05
Task Value	2.94	2.94	3.72	.057	.047	.47
Control Beliefs	.34	.34	.27	.603	.004	.08
Self-Efficacy	.07	.07	.17	.680	.002	.06
Test Anxiety	2.69	2.69	1.87	.175	.024	.27
Peer Learning	3.61	3.61	19.32**	.001	.203	.99

[1] *F* ratios are Greenhouse-Geisser approximation of *F*s. *df* = 1, 76.

However, there was no significant difference found between the treatment and control groups on the other subscales of MSLQ at the .05 significant level. The Task Value measure indicated high mean difference (mean difference = .275, *SD* = 2.36) favoring anchored instruction condition. However, it failed to reach statistical significance (*F* = 3.72, *p* = .057).

Within-Group Comparisons of MSLQ

The means and standard deviations for pretest and posttest scores for students with and without LD in the anchored instruction group and comparison group are presented in Table 4.3.

Anchored Instruction Student Results

The results of the 2 x 2 x 2 doubly MANOVA revealed significant differences between the pretest and posttest MSLQ in favor of the posttest, indicating that students' motivation to learn changed significantly after anchored instruction, *F* (7, 32) = 4.99, *p* < .01, and the effect size was large, η2 = .52. With regard to the comparison between students with and without LD, the results of the MANOVA revealed no significant

differences [F (7, 32) = 1.04, p = .41], indicating that students with and without LD were not different in motivational changes after anchored instruction. The results were summarized in Table 4.6.

Table 4.6 Doubly MANOVA Results for Anchored Instruction Group

Within Subjects Effect	***F***	***df***	**Error *df***	***p***	***η2***	**Power**
Time	4.99**	7	32	.00	.52	.98
Time X Student	1.04	7	32	.41	.18	.37

Subsequently a univariate analysis was conducted to investigate the impact of anchored instruction on each subscale of students' motivation to learn measured by the MSLQ. As presented in Table 4.7, the univariate analysis results revealed a significant difference between the pretest and posttest Task Value [F (1, 38) = 5.73, p < .05)] and Peer Learning [F (1, 38) = 18.98, p < .01] scores. The interaction effect between Time X Student on the other subscales did not reach statistical significance, indicating no significant difference in motivational changes between students with and without LD in anchored instruction condition over time.

Table 4.7 Univariate Analyses of Variance for Time and Time X Student for MSLQ

Source	**Variable**	**Type III *SS***	***df***	***MS***	***F***	***p***
Time	Intrinsic Goal	.60	1	.60	.95	.33
	Extrinsic Goal	1.63	1	1.63	1.65	.20
	Task Value	5.72	1	5.72	5.73*	.02
	Control Beliefs	.35	1	.35	.28	.59
	Self-Efficacy	.003	1	.003	.00	.93
	Test Anxiety	1.72	1	1.72	1.42	.24
	Peer Learning	4.59	1	4.59	18.98*	.00
Time X Student	Intrinsic Goal	2.04	1	2.04	3.21	.08

	Extrinsic Goal	.80	1	.80	.81	.37
	Task Value	.07	1	.07	.07	.78
	Control Beliefs	.94	1	.94	.76	.38
	Self-Efficacy	.61	1	.61	1.34	.25
	Test Anxiety	.01	1	.01	.01	.93
	Peer Learning	.22	1	.22	.94	.33

Error *df* = 38.

Non-Anchored Instruction Condition Student Results

The same analyses were conducted for the comparison group. The results of the doubly MANOVA revealed no significant difference between the pretest and posttest MSLQ scores in the comparison condition, indicating that comparison students' motivation to learn did not change significantly over time, F (7, 32) = .61, p = .73. The results were summarized in Table 4.8.

Table 4.8 Doubly MANOV for Comparison Student MSLQ Scores

Source	***F***	***df***	**Error *df***	***p***	***η2***	**Power**
Time	.61	7	32	.73	.11	.22
Time X Student	.377	7	32	.90	.07	.14

In terms of students with and without LD, the interaction effect between time and student also was not significant, F (7, 32) = .37, p = .90. It indicated that students' motivation to learn regardless of labeling students did not change over the Nightjohn curriculum in non-anchored instruction group.

EFFECTS ON SITUATED MOTIVATION SURVEY

Multivariate Assumption Tests

Preliminary assumption tests were conducted to ensure that there was no violation of the assumptions of multivariate homogeneity and normality of variance.

Homogeneity of Variance

The Box's M' significant values (Box's M = 503.880, F = 1.031, df = 253, 7616.06, P = .357) were larger than .001. Therefore, the SMS data have not violated the homogeneity of variance-covariance assumption. It indicated the dependent variables are equal across groups.

Levene's test of equality of error variances also was employed to investigate if the data violates the assumption of equality of variance for variables. The test results are presented in Table 4.9. None of the variables recorded significant vales at the .05 level, indicating that the data can be assumed equal variances.

Table 4.9 Levene's Test for SMS Pretest and Posttest

Scale	**Testing time**	***F***	***df1***	***Df2***	***p***
Subjective Competence	Pretest	2.64	3	76	0.06
	Posttest	1.37	3	76	0.26
Relevance	Pretest	1.70	3	76	0.18
	Posttest	0.75	3	76	0.53
Interestingness	Pretest	1.55	3	76	0.21
	Posttest	0.06	3	76	0.98
Learning Orientation	Pretest	0.31	3	76	0.82
	Posttest	1.18	3	76	0.32
Performance Orientation	Pretest	1.35	3	76	0.27
	Posttest	1.77	3	76	0.16
Work Avoidance1	Pretest	0.73	3	76	0.54
	Posttest	0.57	3	76	0.64
Work Avoidance2	Pretest	0.62	3	76	0.60
	Posttest	0.63	3	76	0.60
Surface-Level	Pretest	1.40	3	76	0.25
	Posttest	0.71	3	76	0.55
Individual Cognitive	Pretest	0.20	3	76	0.90
	Posttest	0.19	3	76	0.90
Distributed Cognitive1	Pretest	0.58	3	76	0.63
	Posttest	1.13	3	76	0.34
Distributed Cognitive2	Pretest	0.76	3	76	0.52
	Posttest	1.43	3	76	0.24

Multivariate Normality

To test multivariate normality, data skewness and kurtosis were analyzed. As indicated before, skewness and kurtosis should be within the +2 to -2 range when the data are normally distributed. As indicated in the Table 4.10, no data was out of range in skewness. Similar to the results of MSLQdata, the majority of values for skewness and kurtosis also were negative, indicating a relatively flat distribution of data that were skewed left.

Table 4.10 Summary of Normality Assumption Tests

Scale		**Skewness**	**Kurtosis**	**Descriptive Statistics**	
		Statistic (*SE* = .27)	**Statistic (*SE* = .53)**	***Mean***	***Median***
Subjective Competence	Pretest	-0.67	-0.03	3.70	4.00
	Posttest	-1.01	1.19	4.11	4.00
Relevance	Pretest	-0.54	-0.14	3.57	3.50
	Posttest	-0.41	-0.97	3.90	4.00
Interestingness	Pretest	-0.46	-0.44	3.42	3.50
	Posttest	-0.47	-0.52	3.66	4.00
Learning Orientation	Pretest	-1.11	0.59	3.91	4.19
	Posttest	-0.48	-0.53	3.80	3.83
Performance Orientation	Pretest	0.58	-0.29	2.36	2.12
	Posttest	-0.02	-0.70	3.03	3.20
Work Avoidance1	Pretest	-0.14	-0.39	3.16	3.00
	Posttest	-0.08	-0.29	3.26	3.25
Work Avoidance2	Pretest	-0.73	-0.05	3.60	3.50
	Posttest	-0.52	-0.13	3.65	4.00
Surface-Level	Pretest	0.62	-0.20	2.61	2.50
	Posttest	0.30	-0.64	2.48	2.40
Individual Cognitive	Pretest	-0.64	-0.06	3.45	3.50
	Posttest	-0.46	-0.18	3.56	3.67
Distributed Cognitive1	Pretest	-0.72	0.04	3.40	3.67
	Posttest	-0.41	-0.29	3.39	3.50
Distributed Cognitive2	Pretest	-0.08	-0.90	2.89	3.00
	Posttest	-0.07	-0.78	2.92	3.00

Between-Group Comparisons of SMS

To investigate the between-groups comparisons of SMS, a doubly MANOVA was performed. As indicated at the analysis of MSLQ data, the two independent variables were instructional conditions and types of student. The within-subjects factor was time. SMS is consisted of three 2nd order subscales, including task appraisals, motivation orientation, and strategic activity. Each of them has subscales. Task appraisals include subjective competence, relevance, and interestingness. Motivation orientation includes learning orientation, performance orientation, work avoidance1, and work avoidance2. Finally, strategic activity includes surface-level, individual, distributed 1, and distributed 2 scales. The mean and standard deviation at the pretest and posttest of SMS are presented in Table 4.11.

Table 4.11 Descriptive Statistics for SMS for Pretest and Posttest

Variable (Scale)		**Anchored Instruction**			**No-anchored Instruction**		
		Without LD	**With LD**	**Total**	**Without LD**	**With LD**	**Total**
		***M* (*SD*)**	***M* (*SD*)**	***M* (*SD*)**	***M* (*SD*)**	***M* (*SD*)**	***M* (*SD*)**
Subjective Competence	Pre	3.62 (1.10)	3.91 (.61)	3.72 (.96)	3.60 (1.14)	3.83 (.81)	3.69 (1.03)
	Post	4.23 (.81)	4.17 (.63)	4.21 (.75)	3.92 (.91)	4.21 (1.20)	4.02 (1.01)
Relevance	Pre	3.63 (.97)	3.44 (.77)	3.56 (.90)	3.50 (1.17)	3.75 (.64)	3.59 (1.01)
	Post	4.05 (.81)	3.53 (.90)	3.87 (.87)	3.86 (.90)	4.03 (1.02)	3.92 (.93)
Interestingness	Pre	3.19 (1.13)	3.10 (.78)	3.16 (1.01)	3.70 (.99)	3.67 (.72)	3.69 (.90)
	Post	3.86 (.97)	3.46 (.84)	3.72 (.94)	3.63 (.86)	3.57 (.93)	3.61 (.88)
Learning Orientation	Pre	4.15 (1.00)	3.59 (1.04)	3.95 (1.04)	3.84 (1.00)	3.90 (.88)	3.86 (.95)
	Post	3.87 (.99)	3.71 (.70)	3.82 (.89)	3.70 (.91)	3.96 (.75)	3.79 (.86)

Performance Orientation	Pre	2.15 (1.08)	2.75 (.72)	2.36 (1.00)	2.22 (1.08)	2.60 (.98)	2.35 (1.05)
	Post	2.86 (.85)	3.15 (1.26)	2.96 (1.00)	2.68 (.98)	3.90 (.87)	3.11 (1.10)
Work Avoidance1	Pre	2.88 (1.03)	3.57 (.82)	3.12 (1.01)	3.11 (1.12)	3.39 (.85)	3.21 (1.03)
	Post	3.17 (1.06)	2.78 (.84)	3.03 (1.00)	3.28 (.96)	3.89 (.81)	3.50 (.94)
Work Avoidance2	Pre	3.50 (1.19)	3.46 (1.04)	3.48 (1.12)	3.65 (1.04)	3.82 (1.18)	3.71 (1.08)
	Post	3.46 (1.07)	3.35 (.90)	3.42 (1.00)	3.76 (1.02)	4.07 (.82)	3.87 (.95)
Surface-Level	Pre	2.58 (1.22)	2.30 (.83)	2.48 (1.10)	2.75 (1.05)	2.70 (.80)	2.73 (.96)
	Post	2.29 (1.02)	2.62 (.98)	2.41 (1.01)	2.41 (.88)	2.81 (1.02)	2.55 (.94)
Individual Cognitive	Pre	3.60 (.87)	3.34 (.97)	3.51 (.90)	3.40 (1.05)	3.40 (.93)	3.40 (1.00)
	Post	3.65 (.86)	3.39 (.81)	3.56 (.84)	3.47 (.78)	3.73 (.75)	3.56 (.77)
Distributed Cognitive1	Pre	3.42 (1.14)	3.40 (.96)	3.42 (1.06)	3.24 (1.13)	3.66 (.97)	3.39 (1.08)
	Post	3.47 (.91)	3.28 (1.27)	3.40 (1.03)	3.14 (.91)	3.83 (.85)	3.38 (.94)
Distributed Cognitive12	Pre	3.04 (1.07)	2.81 (1.27)	2.96 (1.13)	2.80 (1.03)	2.85 (1.29)	2.82 (1.11)
	Post	2.76 (1.19)	2.97 (1.14)	2.84 (1.16)	2.74 (1.13)	3.51 (.74)	3.01 (1.07)

The primary doubly MANOVA revealed a significant difference in pretest-posttest scores in the SMS for the two instruction groups, F (11, 66) = 513, $p < .01$). The effect size was .46. However, the Time X Class was not significant, indicating that the motivation measured by SMS did not differ on the basis of instruction conditions. The interaction effects between Time X Student and Time X Class X Student were not significant. This result suggested that students with and without LD did not differ in motivation changes and they were not different on the basis of instruction conditions.

Table 4.12 Multivariate Repeated Measures MANOVA Results from the SMS

Within Subjects Effect	***F***	***df***	**Error *df***	***p***	***η2***	**Power**
Time	5.13**	11	66	.00	.46	1.00
Time X Class	1.34	11	66	.22	.18	.65
Time X Student	1.48	11	66	.16	.19	.70
Time X Class X Student	.77	11	66	.66	.11	.38

Although there were no significant results on the multivariate test between Time X Class, Time X Student, and Time X Class X Student, the follow up univariate analysis for the each subscale of SMS was conducted to investigate the specific impact of each type of instruction on students' situated motivation. Therefore, the probability of the Type I error rate may increase in the follow-up analysis (Kleinbaum, Kupper, & Muller, 1988). The univariate analysis revealed the significant Time X Class X Student effect on Work Avoidance1 [(F (1, 76) = 5.73, p = .019], suggesting that students with and without LD differ in Work Avoidance1 based on the instruction conditions that they participated in over the time. The students with LD demonstrated the highest Work Avoidance1 score on the non-anchored instruction posttest (M = 3.89, SD = .81). On the other hand, Work Avoidance1 of students with LD in anchored instruction decreased at the post-test (mean difference = .34). The univariate analysis also revealed a significant difference between anchored instruction and non-anchored instruction in Interestingness [(F (1, 76) = 4.04, p = .49] and Work Avoidance 1 [F (1, 76) = 6.74, p = .011] for the time variable.

Table 4.13 Univariate Analysis for SMS

Source	Measure	Type III *SS*	*MS*	*F*	*p*	*η2*	Power
Time X Class	Subjective Competence	.07	.07	.12	0.73	.00	.06
	Relevance	.03	.03	.06	0.80	.00	.05
	Interestingness	3.30	3.30	6.74**	0.01	.08	.72
	Learning Orientation	001	001	.04	0.83	.00	.05
	Performance Orientation	.95	.95	1.17	0.28	.01	.18
	Work Avoidance1	3.11	3.11	4.00*	0.05	.05	.50
	Work Avoidance2	.59	.59	.84	0.36	.01	.14
	Surface-Level	.15	.15	.33	0.57	.00	.08
	Individual Cognitive	.21	.21	.68	0.41	.01	.12
	Distributed Cognitive1	.04	.04	.05	0.81	.00	.05
	Distributed Cognitive2	1.12	1.12	2.05	0.16	.02	.29
Time X Class X Student	Subjective Competence	.37	.37	.58	0.45	.00	.11
	Relevance	.14	.14	.24	0.62	.00	.07
	Interestingness	.17	.17	.35	0.55	.00	.09
	Learning Orientation	.08	.08	.25	0.62	.00	.07
	Performance Orientation	2.94	2.94	3.62	0.06	.04	.46
	Work Avoidance1	4.46	4.46	5.73*	0.02	.07	.65
	Work Avoidance2	.09	.09	.13	0.72	.00	.06
	Surface-Level	.06	.06	.13	0.71	.00	.06
	Individual Cognitive	.15	.15	.51	0.48	.01	.10
	Distributed Cognitive1	.42	.42	.54	0.46	.01	.11
	Distributed Cognitive12	.17	.17	.31	0.58	.00	.08

df = 1, 76.

Within-Group Comparisons of Situated Motivation

Anchored Instruction Student Results

A doubly MANOVA was conducted to compare scores on each subscale of SMS prior to the intervention and following the intervention with students with and without LD as between-group factor. The means and standard deviations of pretest and posttest are presented in Table 4.11. There was a significant effect for time, F (11, 28) = 3.81, p <.01, effect size was large, η2 = .60. It indicated that students' situated motivation changed significantly after completing the anchored instruction. With regard to the comparison between students with and without LD, the results of the MANOVA revealed no significant differences between them, indicating that students with and without LD were not different in motivational changes. The MANOVA results were summarized in Table 4.14.

Table 4.14 Multivariate Repeated Measure Analyses of Variance for SMS

Within Subjects Effect	***F***	***df***	**Error *df***	***p***	***η2***	**Power**
Time	3.81**	11	28	.00	.60	.98
Time X Student	1.30	11	28	.27	.33	.54

Subsequent univariate analysis was performed on the each subscale of SMS. The results of univariate analysis revealed a significant difference between the pretest and posttest Subjective Competence, Interestingness, and Performance Orientation scores. In addition, the univariate analysis for the subscales of SMS revealed significant difference between students with and without LD in Work Avoidance1. Students with LD's Work Avoidance1 decreased significantly at the post-test, F (1, 38) = 1.28, p < .05.

Table 4.15 Univariate Analyses of Variance for SMS for Anchored Instruction Condition

Source	**Measure**	**Type III *SS***	***MS***	***F***	***p***	***η2***	***Power***
Time	Subjective Competence	3.47	3.47	5.98*	0.02	0.14	0.66
	Relevance	1.21	1.21	2.27	0.14	0.06	0.31
	Interestingness	4.83	4.83	10.90**	0.00	0.22	0.90
	Learning Orientation	0.12	0.12	0.29	0.59	0.01	0.08
	Performance Orientation	5.58	5.58	6.96**	0.01	0.16	0.73
	Work Avoidance1	1.13	1.13	1.28	0.27	0.03	0.20
	Work Avoidance2	0.10	0.10	0.11	0.74	0.00	0.06
	Surface-Level	0.01	0.01	0.01	0.91	0.00	0.05
	Individual Cognitive	0.04	0.04	0.16	0.69	0.00	0.07
	Distributed Cognitive1	0.03	0.03	0.03	0.88	0.00	0.05
	Distributed Cognitive2	0.06	0.06	0.12	0.73	0.00	0.06
Time X Student	Subjective Competence	0.53	0.53	0.92	0.34	0.02	0.15
	Relevance	0.50	0.50	0.93	0.34	0.02	0.16
	Interestingness	0.45	0.45	1.03	0.32	0.03	0.17
	Learning Orientation	0.69	0.69	1.73	0.20	0.04	0.25
	Performance Orientation	0.43	0.43	0.54	0.47	0.01	0.11
	Work Avoidance1	5.25	5.25	5.97*	0.02	0.14	0.66
	Work Avoidance2	0.02	0.02	0.02	0.88	0.00	0.05
	Surface-Level	1.75	1.75	3.79	0.06	0.09	0.48
	Individual Cognitive	0.00	0.00	0.00	0.99	0.00	0.05
	Distributed Cognitive1	0.13	0.13	0.13	0.73	0.00	0.06
	Distributed Cognitive2	0.89	0.89	1.85	0.18	0.05	0.26

df = 1, 38.

Non-Anchored Instruction Student Results

The results of the multivariate repeated measure analyses revealed a significant difference between the pretest and posttest SMS scores in non-anchored instruction

condition, F (11, 28) = 2.85, p = .012. With regard to the comparison between students with and without LD, the results of the MANOVA revealed no significant differences, indicating that students with and without LD were not different in motivational changes. The results were summarized at Table 4.16.

Table 4.16 MANOVA for Non-anchored Instruction Students' SMS

Within Subjects Effect	**F**	**df**	**Error df**	**p**	**η2**	**Power**
Time	2.85**	11	28	.00	.52	.92
Time X Student	.66	11	28	.76	.20	.27

The subsequent univariate analysis was performed on each subscale of SMS. The results of the analysis yielded a statistically significant effect between the pretest and posttest Performance Orientation score. The pairwise comparisons yielded .87 (*SE* = .21) mean difference (posttest – pretest) that was significant at the .05 level. The pairwise comparisons between students with and without LD indicated .80 (*SE* = 2.55) in mean difference that was significant at the .05 level. The performance orientation score of students with LD was higher than that of students without LD. In addition, students with LD's performance orientation score increased more than that of students without LD. The results of univariate analysis revealed no significant differences between students with and without LD on the subscales.

Table 4.17 Univariate Analyses of Variance for Non-anchored Instruction Students' SMS

Source	**Measure**	**Type III *SS***	***MS***	***F***	***p***	***η2***	***Power***
Time	Subjective Competence	2.16	2.16	3.12	0.09	0.08	0.41
	Relevance	1.91	1.91	2.90	0.10	0.07	0.38
	Interestingness	0.14	0.14	0.26	0.61	0.01	0.08
	Learning Orientation	0.03	0.03	0.09	0.77	0.00	0.06

	Performance Orientation	14.04	14.04	17.08 **	0.00	0.31	0.98
	Work Avoidance1	2.06	2.06	3.04	0.09	0.07	0.40
	Work Avoidance2	0.61	0.61	1.17	0.29	0.03	0.18
	Surface-Level	0.23	0.23	0.50	0.49	0.01	0.11
	Individual Cognitive	0.74	0.74	2.15	0.15	0.05	0.30
	Distributed Cognitive1	0.02	0.02	0.04	0.85	0.00	0.05
	Distributed Cognitive2	1.60	1.60	2.58	0.12	0.06	0.35
Time X Student	Subjective Competence	0.02	0.02	0.03	0.88	0.00	0.05
	Relevance	0.03	0.03	0.04	0.84	0.00	0.05
	Interestingness	0.01	0.01	0.01	0.91	0.00	0.05
	Learning Orientation	0.17	0.17	0.56	0.46	0.01	0.11
	Performance Orientation	3.13	3.13	3.81	0.06	0.09	0.48
	Work Avoidance1	0.49	0.49	0.72	0.40	0.02	0.13
	Work Avoidance2	0.08	0.08	0.16	0.69	0.00	0.07
	Surface-Level	0.93	0.93	2.02	0.16	0.05	0.28
	Individual Cognitive	0.31	0.31	0.89	0.35	0.02	0.15
	Distributed Cognitive1	0.33	0.33	0.58	0.45	0.02	0.12
	Distributed Cognitive2	2.35	2.35	3.78	0.06	0.09	0.47

df = 1, 38.

EFFECTS ON CURRICULUM-BASED ACHIEVEMENT TEST

Means and standard deviations of the curriculum-based achievement test are presented in Table 4.18. A two-way between-group multivariate analysis of covariance (MANCOVA) was performed to investigate group differences in the achievement test. For the Nightjohn curriculum, the curriculum-based achievement test had three subtests. They are part A, which is the recall of detailed information; part B, which is the comprehension of main themes and characters; and part C, which is the understanding of the historical and social context. The independent variables were instructional conditions:

anchored instruction and no-anchored instruction, and types of students: students with and without LD.

Table 4.18 Descriptive Statistics for Achievement Pretest and Posttest

Variable (scale)		Anchored Instruction			No-anchored Instruction		
		Without LD	With LD	Total	Without LD	With LD	Total
		M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
Total	Pre	1.53 (2.19)	2.14 (2.10)	1.75 (2.15)	1.80 (1.52)	2.14 (2.56)	1.92 (1.92)
	Post	17.84 (2.69)	16.21 (2.15)	17.27 (2.61)	17.00 (3.32)	15.21 (3.28)	16.37 (3.37)
[1]Part A	Pre	.11 (.32)	.14 (.36)	.12 (.33)	.03 (.19)	.07 (.26)	.05 (.22)
	Post	7.50 (1.10)	7.07 (1.14)	7.35 (1.12)	7.11 (1.42)	6.78 (1.42)	7.00 (1.41)
[2]Part B	Pre	.11 (.32)	.14 (.36)	.12 (.33)	.03 (.19)	.07 (.26)	.05 (.22)
	Post	6.03 (1.86)	5.35 (1.49)	5.80 (1.75)	5.38 (1.87)	4.00 (1.70)	4.90 (1.91)
[3]Part C	Pre	1.30 (1.84)	1.42 (1.55)	1.35 (1.73)	1.46 (1.13)	1.57 (1.50)	1.50 (1.26)
	Post	4.30 (1.73)	3.64 (1.73)	4.07 (1.74)	4.50 (1.86)	4.42 (2.31	4.47 (1.99)

[1]Part A = Recall of detailed information; [2]Part B = Comprehension of main themes and characters; [3]Part C = Understanding of the historical and social context.

To investigate students' prior knowledge of Nightjohn before intervention, teachers asked students whether they had read Nightjohn. No students reported that they had read the Nightjohn before the pretest. Therefore, when students had no idea what the answer was, they left the item blank rather than provide a wild guess during the pretest. Most students left the item blank on the pretest. Consequently, the results of pretest on Part A (M = .08, SD = .22) and Part B (M = .08, SD = .28) yielded small means. MANOVA for pretest revealed that there were no significant difference between experimental and comparison groups at the pretest Part A and Part B, F (2, 75) = 1.36, p

= .26. With regard to the comparison of students with and without LD, there was no significant difference between them on the amount of prior knowledge about Nightjohn, F (2, 75) = .22, p = .79.

Students in both instruction conditions reported that they never learned about the social and historical background knowledge related to Nightjohn (e.g., slavery in America, Civil War, and 19th century life). However, ANOVA yielded no significant difference between instructional conditions [F (1, 76) = .17, p = .68] and types of students [F (1, 76) = .10, p = .749].

Test of Assumptions

To analyze the curriculum-based achievement posttest data, MANCOVA was performed using pretest total score as a covariate. Preliminary assumption testing was conducted to check for multivariate normality, homogeneity of variance, and homogeneity of regressions for a covariate.

Homogeneity of variance

To investigate if achievement data violates the multivariate equivalent of homogeneity of variance assumption, Box's Test of equality covariance matrices was employed. The Box's M' significant values of academic achievement were larger than .001, the Box's M = 11.06, F (18, 10497.33) = .56, p = .92. Therefore, the achievement data have not violated this assumption. The results of Levene's Test also indicated that a curriculum-based achievement test including the total score [F (3, 76) = .83, p = .48], part A [F (3, 76) = .1.00, p = .39], part B [F (3, 76) = .66, p = .57], and part C [F (3, 76) = .25, p = .85] meet the assumption of equal variances at .05 significant level.

Multivariate Normality

To test multivariate normality, data skewness and kurtosis were analyzed. As indicated in the Table 4.19, no data were out of acceptable range in skewness and kurtosis, between -2 and 2. The data was negatively skewed

Table 4.19 Results of Normality Assumption Tests

Scale	**Skewness**		**Kurtosis**		**Descriptive Statistics**	
	Statistic	***SE***	**Statistic**	***SE***	**Mean**	**Median**
Part A	-.52	.27	-.13	.53	7.17	8.00
Part B	-.34	.27	-.11	.53	5.35	5.00
Part C	-.29	. 27	.36	.53	4.27	5.00
Total	-.28	. 27	.21	.53	16.82	17.00

Homogeneity of regression

The homogeneity of regressions assumption indicates that the slopes of the regression lines should be the same for each group in MANCOVA. If this assumption is violated, the results are more likely to increase Type II errors. To test the homogeneity of regressions assumption with pretest score as a covariate, group by covariate interaction effects were examined. In order to meet the assumption, the interaction effects should not be significant. The results of MANOVA indicated that the curriculum-based achievement test did not violate this assumption. There were no significant interactions between the instruction conditions and covariate [F (4, 73) = .46, p = .76] and between types of students and covariate [F (4, 73) = 1.41, p = .23].

Between-Group Comparisons of Academic Achievement

To analyze the between-groups differences in the curriculum-based achievement posttest data, MANCOVA was calculated using pretest total score as a covariate. MANCOVA revealed that there was no interaction effect between Class X Student,

indicating the achievement of students with and without LD did not differ on the basis of the instructional conditions. MANCOVA yielded significant differences on the posttest scores between instructional conditions and the types of student. The results are presented in Table 4.20.

Table 4.20 Multivariate Analyses of Covariance for Curriculum-Based Achievement

Source	***F***	***df***	**Error *df***	***P***	***η2***	**Power**
Intercept	458.89	4	72	.00	.96	1.00
Pretest	1.07	4	72	.37	.05	.32
Class	2.78*	4	72	.03	.13	.73
Student	3.19*	4	72	.01	.15	.80
Class X Student	1.37	4	72	.25	.07	.40

To compare the anchored instruction group and the control group on the separate parts of the curriculum-based achievement, ANCOVA was performed using pretest total score as a covariate. Subsequent analysis of covariance revealed a significant intervention effect on Part B, F (1, 75) = 5.68, $p < .020$. Pairwise comparisons from Bonferroni-adjustment yielded 1.005 mean difference (SE = .422) favoring anchored instruction condition in Part B, the comprehension of main themes and characters. The scores of the anchored instruction group were higher in Part A and total score although they were not significant at alpha level .05. Unexpectedly, the Part C scores; understanding of the historical/social contexts of the comparison group scored higher than anchored instruction although the difference was not statistically significant (mean difference = .50, SE = .445). The effect size was .07 and the observed power was .65.

In addition, students without LD earned significantly higher scores in Part B and total score than those of students with LD, F (1, 75) = 6.00, $p < .01$ and F (1, 75) = 6.19, $p < .01$ respectively. Pairwise comparisons indicated that students without LD were

higher than students with LD in all parts. In particular, the mean difference in Part B was the largest (mean difference = 1.03, *SE* = .422). The effect size (η2) of the Part B and the total score was .07.

Table 4.21 Analysis of Covariance for Instructional Condition and Student Type

Source	**Part**	**Type III *SS***	***MS***	***F***	***p***	***η2***	**Power**
Pretest Covariate	Part A	7.61	7.61	4.88	.03	.06	.58
	Part B	2.43	2.43	.00	.99	.00	.05
	Part C	.90	.90	.25	.61	.00	.07
	Total	3.28	3.28	.37	.54	.00	.09
Class	Part A	2.43	2.43	1.56	.21	.02	.23
	Part B	18.35	18.35	5.68*	.02	.07	.65
	Part C	4.53	4.53	1.26	.26	.01	.19
	Total	16.15	16.15	1.85	.17	.02	.26
Student	Part A	2.95	2.95	1.89	.17	.02	.27
	Part B	19.39	19.39	6.00**	.01	.07	.67
	Part C	2.35	2.35	.65	.42	.01	.12
	Total	54.04	54.04	6.19**	.01	.07	.69
Class X Student	Part A	.04	.04	.03	.86	.00	.05
	Part B	2.25	2.25	.69	.40	.01	.13
	Part C	1.59	1.59	.44	.50	.01	.10
	Total	.10	.10	.01	.91	.00	.05

df = 1, 75

Within-Group Comparisons of Academic Achievement

As the large *F* values for time effect were predicted due to the small means attained on the pretest scores, the within-group comparisons between pretest and posttest were not performed. Therefore, the differences between students with and without LD within each instructional group were examined. The results of MANCOVA revealed no significant differences in the curriculum-based achievement posttest scores between

students with and without LD, F (4, 34) = 2.55, p = .06. The subsequent ANCOVA indicated that students with and without LD differ in a total score, F (1, 37) = 4.08, p = .05. However, there were no significant differences in separate parts. In particular, Part B [F (1, 37) = 1.08, p = .31] and Part C [F (1, 37) = 1.66, p = .21] were not significantly different.

For the non-anchored instruction group, the results of MANCOVA were similar to those of the anchored instruction group. In terms of students with and without LD, there was no significant difference between them. However, ANCOVA revealed that there was a significant difference in Part B between students with and without LD, F (1, 37) = 6.73, p = .01. The pairwise comparisons adjusted by Bonferroni indicated a 1.50 mean difference in Part B between students with and without LD. In contrast, other two parts were not significantly different, in particular the F values of Part A and Part C were small, .61 and .01 respectively.

EFFECTS ON TOSCRF

Means and standard deviations of TOSCRF are presented in Table 4.22. A two-way between-group repeated MANCOVA was performed to investigate groups' differences in TOSCRF. Students' TOSCRF scores on the pretest were used as a covariate in this analysis

Table 4.22 Descriptive Statistics for the Achievement Pre-test and Post-test

Variable (scale)		**Anchored Instruction**			**No-anchored Instruction**		
		Without LD	**With LD**	**Total**	**Without LD**	**With LD**	**Total**
		M (SD)	***M (SD)***	***M (SD)***	***M (SD)***	***M (SD)***	***M (SD)***
TOSCRF	Pre	95.15 (10.29)	87.57 (8.69)	92.50 (10.32)	94.84 (6.93)	83.71 (7.51)	90.95 (8.86)
	Post	98.88 (10.61)	89.64 (9.87)	95.65 (11.16)	96.84 (7.12)	87.00 (7.39)	93.40 (8.56)

Test of Assumptions

Preliminary assumption tests were conducted to ensure that there was no violation of the assumptions of normality, homogeneity of variance, and homogeneity of regressions. No serious violations were noted.

Homogeneity of Variance

To investigate if TOSCRF data violates the multivariate equivalent of homogeneity of variance assumption, Box's Test of Equality Covariance Matrices was analyzed. As indicated earlier, if the significant value is larger than .001, it means that the data have not violated the assumption (Tabachnick & Fidell, 1996). The Box's M' significant value of TOSCRF was larger than .001, the Box's M = 12.70, F (9, 22924.66) = 1.33, p = .212. Therefore, the TOSCRF data are equal across groups, indicating that this data have not violated this assumption.

The results of Levene's Test for the assumption of equality of variance for variables on the pretest [F (3, 76) = 1.23, p = .30] and posttest [F (3, 76) = 1.15, p = .33] of TOSCRF were conducted. None of the variables recorded significant at .05 significant level.

Multivariate Normality

For the skewness and kurtosis of TOSCRF data, the descriptive statistics reported data ranges from -11 to .53, indicating TOSCRF did not violate the normality assumption. In addition, the significant values of Shapiro-Wilk on the pretest and posttest of TOSCRF were larger than the cut-off of .05. In case of anchored instruction condition, the significant values on the pretest and the posttest were .45 and .66 respectively. The significant values on pretest and posttest with non-anchored instruction students' scores were .67 and .33 respectively.

Homogeneity of Regressions

To test the homogeneity of regressions, the interaction effects were examined with the pretest score as a covariate. The results reported no violation of assumption. The instruction condition by pretest effect and types of student by pretest effect were not significant, F (1, 75) = 2.28, p = .13 and F (1, 75) = 2.49, p = .11 respectively. As all of these significance levels were greater than .05, the homogeneity of regression assumption was met.

Between-Group Comparisons of TOSCRF

A preliminary ANOVA for pretest yielded no significant interaction effect between instructional condition by type of student, F (1, 76) = .78, p = .37. In addition, there was no significant difference between instructional conditions, F (1, 76) = 1.07, p = .30. As predicted, there was significant difference between students with and without LD in TOSCRF score, F (1, 76) = 21.74, $p < .01$.

A repeated measures MANOVA for posttest yielded significant effect for time, F (1, 76) = 14.71, $p < .01$. The effect size ($\eta 2$) was .16. This result indicated that there was a significant change in TOSCRF score across the two different time periods regardless of instructional conditions. However, there were no interaction effects between Time X Class X Student, Time X Student, and Time X Class. The results are presented in Table 4.23.

Table 4.23 Repeated Multivariate Analyses of Variance TOSCRF

Effect	***F***	***df***	**Error *df***	***p***	***η2***	***Power***
Time	14.71**	1	76	.01	.16	.96
Time X Class	.03	1	76	.85	.00	.05
Time X Student	.01	1	76	.89	.00	.05
Time X Class X Student	1.03	1	76	.31	.01	.17

As the result of MANOVA revealed no interaction effects with small *F*-values in Time X Student and Time X Class, and Time X Class X Student, the within-group comparisons of TOSCRF were not conducted.

MOTIVATION DIFFERENCES BETWEEN STUDENTS WITH AND WITHOUT LD

The second research question concerned differences in the motivation to learn language arts between students with and without LD. To investigate the motivational differences between students with and without LD in language arts class, MANOVA and subsequent ANOVAs were conducted with students' pretest data that exclude the intervention effects.

Motivated Strategies for Learning Questionnaire

Table 4.24 presents summary statistics between students with and without LD on the MSLQ. For six subscales of MSLQ, the results of MANOVA were not statistically significant, F (7, 72) = .18, p = .98, which demonstrated that there were no significant differences among the dependent variables between students with and without LD.

Table 4.24 Summary Statistics and Group Differences for MSLQ

Variable	**Students without LD (n = 52)**		**Students with LD (n=28)**	
	M	***SD***	***M***	***SD***
Intrinsic goal	4.62	1.18	4.50	1.18
Extrinsic goal	5.58	1.16	5.58	1.20
Task value	4.84	1.21	4.72	1.11
Control belief	4.83	1.26	4.91	1.24
Self-efficacy	5.18	.84	5.13	.72
Test anxiety	3.80	1.49	4.00	1.81
Peer learning	3.89	1.35	4.00	1.34

The follow up univariate analysis was conducted to examine the difference between students with and without LD for each subscale of MSLQ. The results of univariate analysis also yielded no significant difference between students with and without LD in any subscale of MSLQ at the .05 significant level. The students with LD reported higher control belief, test anxiety, and peer learning than did students without LD. The mean difference in test anxiety was the largest. However, it did not reach statistical significance. Table 4.25 presents the summary of univariate analysis of MSLQ between students with and without LD.

Table 4.25 Univariate Analysis of Students with and without LD in MSLQ

Variable	***SS***	***MS***	***F***	***p***
Intrinsic Goal Orientation	0.26	0.26	0.19	0.67
Error	109.46	1.40		
Extrinsic Goal Orientation	0.00	0.00	0.00	0.98
Error	108.12	1.39		
Task Value	0.31	0.31	0.22	0.64
Error	109.04	1.40		
Control Beliefs	0.12	0.12	0.08	0.78
Error	123.00	1.58		
Self-efficacy	0.05	0.05	0.08	0.78
Error	50.65	0.65		
Test Anxiety	0.73	0.73	0.28	0.60
Error	202.06	2.59		
Peer Learning	0.21	0.21	0.12	0.74
Error	142.56	1.83		

df = 1, 78.

Situated Motivation Survey

Table 4.26 presents the summary descriptive statistics for SMS measures indicating the differences between students with and without LD. The preliminary MANOVA revealed that there was no significant differences between students with and without LD, F (11, 68) = .99, p = .45.

Table 4.26 Summary Statistics and Group Differences for Situated Motivation Survey

Variable	**Students without LD (*n* = 52)**		**Students with LD (*n*=28)**	
	M	***SD***	***M***	***SD***
Subjective Competence	3.61	1.11	3.87	.71
Relevance	3.56	1.07	3.59	.71
Interestingness	3.44	1.08	3.39	.79
Learning Orientation	3.99	1.00	3.75	.96
Performance Orientation	2.18	1.07	2.68	.85
Work Avoidance 1	3.00	1.07	3.48	.83
Work Avoidance 2	3.57	1.11	3.64	1.11
Surface-Level Activity	2.66	1.13	2.50	.83
Individual Activity	3.50	.96	3.37	.93
Distributed Activity1	3.33	1.12	3.53	.96
Distributed Activity2	2.92	1.05	2.83	1.26

The follow up univariate analysis was conducted to examine the differences for each variable of SMS. The results of univariate analysis of variance yielded significant differences in Performance Orientation [F (1, 78) = 4.42, p = .03] and Work Avoidance 1 [F (1, 78) = 4.22, p = .04]. Pairwise comparisons that were adjusted for multiple comparisons by Bonferroni indicated students with LD's Performance Orientation score was higher than that of students without LD (mean difference = .49, SE = .23) and

students with LD's Work Avoidance1 score was also higher than that of students without LD (mean difference = .48, *SE* = .23). There was no significant difference found between students with and without LD on the other subscales of SMS.

Table 4.27 Univariate Analysis of Students with and without LD in SMS

Variable	***SS***	***MS***	***F***	***p***	**η2**	**Power**
Subjective Competence	1.23	1.23	1.24	0.27	0.02	0.20
Error	77.26	0.99				
Relevance	0.01	0.01	0.01	0.90	0.00	0.05
Error	72.46	0.93				
Interestingness	0.06	0.06	0.06	0.82	0.00	0.06
Error	77.50	0.99				
Learning Orientation	1.10	1.10	1.11	0.29	0.01	0.18
Error	76.79	0.99				
Performance Orientation	4.45	4.45	4.43*	0.04	0.05	0.55
Error	78.46	1.01				
Work Avoidance1	4.23	4.23	4.23*	0.04	0.05	0.53
Error	78.12	1.00				
Work Avoidance2	0.18	0.18	0.18	0.68	0.00	0.07
Error	79.52	1.02				
Surface-Level	0.52	0.52	0.48	0.49	0.01	0.11
Error	84.31	1.08				
Individual Cognitive	0.30	0.30	0.33	0.57	0.00	0.09
Error	71.20	0.91				
Distributed Cognitive1	0.15	0.15	0.12	0.73	0.00	0.06
Error	99.54	1.28				
Distributed Cognitive2	0.73	0.73	0.63	0.43	0.01	0.12
Error	90.05	1.15				

df = 1, 78.

RELATIONS BETWEEN MOTIVATION TO LEARN LEVEL AND ACHIEVEMENT

The zero-order correlational analyses were conducted between posttest MSLQ subscales and posttest curriculum-based academic achievement scores to investigate the relationship between motivation to learn and academic achievement. Table 4.28 presents the zero-order correlations among variables for the overall students, as well as for the two groups of students separately. Cohen (1988) suggests small, medium, and large correlations: r =.10 to .29 or r =.10 to –.29, r =.30 to .49 or r =.30 to –.4.9, and r =.50 to 1.0 or r =.50 to –1.0 respectively.

In terms of overall correlations, students' self-efficacy score was positively related to the Part B score and total achievement score at .05 significant level, r = .22 and r = .24 respectively. The students who rated their self-efficacy high achieved higher scores on curriculum-based achievement test. However, students' level of intrinsic motivation orientation, extrinsic motivation orientation, task value, control beliefs, test anxiety, and peer learning were not related to their curriculum-based achievement including three parts. Test anxiety and peer learning were negatively, although not strongly, related to achievement scores.

Table 4.28 Zero-Order Correlations between Achievement Score and MSLQ Subscales

MSLQ Subscale	Variables			
	Part A	**Part B**	**Part C**	**Total**
Intrinsic goal				
Without LD	-.19	.10	.25	.13
With LD	.31	.02	-.08	.10
Across with and without LD	.08	.01	.04	.07
Extrinsic goal				
Without LD	-.17	.19	.35**	.25
With LD	.29	-.16	-.33	-.19
Across with and without LD	.08	.17	.06	.17
Task value				
Without LD	-.05	.13	.36**	.27*

With LD	.45**	.00	-.45*	-12
Across with and without LD	.09	.03	.15	.14
Control belief				
Without LD	-19	.25	.12	.14
With LD	.05	-.18	-.07	-.16
Across with and without LD	.01	.10	.00	.07
Self-efficacy				
Without LD	-.26	.25	.29*	.22
With LD	.21	-.01	-.08	.04
Across with and without LD	.04	.22*	.15	.24*
Test anxiety				
Without LD	-.09	-.16	.10	-.07
With LD	.01	-.22	-.20	-.32
Across with and without LD	.02	.00	-.11	-.04
Peer learning				
Without LD	-.09	.01	.19	.08
With LD	.13	-.07	.19	.15
Across with and without LD l	-.18	-.10	-.02	-.15

* $p < .05$ and ** $p < .01$ imply that correlation is significant at the either 0.05 or 0.01 level (2-tailed).

In terms of the differences between students with and without LD, the results of analysis indicated differences in correlation patterns. In the case of students without LD, as predicted, the motivation scales including intrinsic motivation (r = .13), extrinsic motivation (r = .25), task value (r = .27), self-efficacy (r = .14), and peer learning (r = .08) were positively correlated to the total achievement scores. In addition, the test anxiety was negatively correlated (r = -.07). In particular, Part C scores were significantly correlated with several subscales of MSLQ. It is significantly correlated with extrinsic motivation ($p < .01$), task value ($p < .01$), and self-efficacy ($p < .05$). In contrast, students with LD showed different correlational patterns. Intrinsic motivation (r = .10), self-efficacy (r = .04), and peer learning (r = .15) were positively correlated to the total achievement scores. The others were correlated negatively with total achievement scores. In addition, the task value score was positively correlated with Part A at .01 significant

level, r = .45 and p < .01. However, it was negatively correlated with Part C at .05 significant level, r = -.45.

The results of correlations between the curriculum-based achievement scores and SMS subscales were presented in Table 4.29. As a total score, only subjective competence was correlated at .01 significant level (r = .25). For Part A; recall of information, relevance was positively correlated, r = .21, p <. 05. In contrast, it was negatively correlated with surface-level activity, r = -.21, p <. 05. For part B; understanding main themes and characters, subjective competence was positively correlated, r = .19, p <. 05. As predicted, the Part C were positively correlated with distributed activity1 (r = .24) and distributed activity 2 (r = .18) at .05 significant level.

In terms of students with and without LD, students with LD's subjective competence was significantly correlated with Part A (r =.44, p <.01). However, students without LD's subjective competence was correlated with Part B, r = .33, p <.05. On the contrary, students with LD showed negative correlation (r = -.10, p > .05). In addition, work avoidance2 of students with LD was negatively correlated with Part B, r = -.44, p <.05.

Table 4.29 Zero-Order Correlations between Achievement Scores and SMS Subscales

	Variables			
SMS Subscale	**Part A**	**Part B**	**Part C**	**Total**
Subjective competence				
Without LD	.00	.33*	.20	.32*
With LD	.44*	-.10	-.16	.03
Across with and without LD	.17	.19*	.10	.25**
Relevance				
Without LD	.08	.24	.04	.21
With LD	.35	-.16	-.09	.00
Across with and without LD	.21*	.10	-.00	.15
Interestingness				
Without LD	.10	.28	.17	.31
With LD	-.16	-.29	1.14	-.35

Across with and without LD	.12	.10	.09	.17
Learning orientation				
Without LD	-.12	.04	.22	.02
With LD	-.06	-.20	-.11	-.24
Across with and without LD	-.00	.03	.06	.05
Performance orientation				
Without LD	-.22	.06	.29*	.11
With LD	.08	-.13	.09	.00
Across with and without LD	-.12	.00	.07	.00
Work avoidance 1				
Without LD	-.27	-.01	-.08	-.16
With LD	-.02	-.20	.37*	.11
Across with and without LD	-.17	-.04	.01	-.09
Work avoidance 2				
Without LD	-.21	.10	.24	.12
With LD	-.20	-.44*	.27	-.18
Across with and without LD	-.16	-.01	.15	.00
Surface-level activity				
Without LD	-.16	.05	-.08	-.08
With LD	-.27	.01	.27	.06
Total	-.21*	-.10	.01	-.14
Individual activity				
Without LD	-.18	.00	.22	.04
With LD	.02	-.20	.07	-.07
Across with and without LD	-.04	-.04	.08	.00
Distributed activity 1				
Without LD	-.17	.08	.41**	.22
With LD	-.02	-.11	.16	.01
Across with and without LD	-.07	-.02	.24*	.08
Distributed activity 2				
Without LD	-.19	.12	.25	.14
With LD	-.05	-.07	.38**	.17
Across with and without LD	-.18	-.08	.18*	-.02

CHAPTER V

Discussion

This study attempted to systematically investigate whether multimedia anchored instruction made differences in 7th grade students with and without LD's motivational responses and academic achievement in language arts. Many researchers are concerned with the decline of students' motivation to learn after the transition from elementary to secondary school (Anderman & Maehr, 1994). As a consequence, students' motivation to learn becomes a stronger predictor of LD as students become older (Sideridis et al., 2006). To date, most approaches to improve motivation to learn for middle school students with LD provided individualized attribution trainings, strategy instruction, and accommodated contents (e.g., Borkowski, Weyhing, & Carr, 1988; Meltzer et al., 2004; Ring & Reetz, 2002; Ryan, Short, & Weed, 1986).

The rationale was that motivation to learn would be improved when support can be adapted to the individual students' differences in motivation to learn. However, the provisions of individualized support that reflect individual student's motivational characteristics may not be easily applied in a typical inclusive general education class. Therefore, instructional programs that incorporate motivationally rich instructional components have the potential to be more effective in a inclusive general education classroom (Hickey, 2003;Svinicki, 1999).

This study investigated a multimedia anchored instruction program (Rieth et al., 2003), which incorporated evidence-based instructional components that contribute to improving students' motivation to learn. This instructional program has successfully established classroom environments that promote student-centered pedagogy, critical thinking skills, classroom interactions, and use of technology (Glaser et al., 1999;

McLaughlin & Thurlow, 2003; Rieth et al., 2003). Furthermore, this instructional program has been shown previously to positively impact student attitudes toward language arts class (Rieth et al., 2003; Xin & Rieth, 2001).

This chapter consists of five sections. The first three sections discuss the results of this study based on the three research questions; (a) What is the impact of participation in anchored instruction on the motivation to learn and academic achievement of students with and without LD in language arts, as compared to students receiving non-anchored instruction?; (b) Are there any differences in the motivation to learn between students with and without LD in language arts?; And (c) What is the relationship between improved motivation to learn and academic achievement of students with and without LD? The last two sections discuss the implications for practice and limitation of this study.

RESEARCH QUESTION 1: EFFECTS OF ANCHORED INSTRUCTION

Effects of Anchored Instruction on Motivation to Learn

The overall results of this study provided evidence that anchored instruction favorably impacted motivation to learn of seventh-grade students with and without LD in a general education language arts class. The MANOVA results on the MSLQ measure revealed significant between-groups effects for two instructional groups favoring anchored instruction at a .01 alpha level. The partial effect size (η^2) was .28, supporting strong effect of anchored instruction. In addition, the MANOVA results revealed significant differences between the pretest and posttest MSLQ and SMS scores in favor of the posttest at a .01 alpha level, and the effect size were large, $\eta 2 = .52$ and $\eta 2 = .60$ respectively. The anchored instruction group improved their motivation to learn with no evidence of negative consequences. The results expand the prior studies that

demonstrated effects on students' cognitive skills, achievement, and changes of classroom climate (Hur, 2001; Reith et al. 2003; Xin & Rieth, 2001) by adding positive effects on motivation to learn. More importantly, the results of this study supported the argument that students with LD also can benefit from the complex project-based anchored instruction without suffering from the negative motivation and academic consequences. The overall results of this study provide strong evidence that anchored instruction is an effective approach that integrates technologies and research-based instructional principles into the classroom learning as a medium for enhancing students' motivation to learn for students with and without LD.

A doubly MANOVA demonstrated significant differences between anchored instruction and non-anchored instruction on the MSLQ measure with each subscale as a variable. The follow up univariate analysis indicated that the students' perceptions of the peer learning component of the anchored instruction group were more positive than that of the non-anchored instruction group. In addition, there was between-groups difference favoring anchored instruction in task value, although the *p*-value was .057. In terms of SMS measure, the results of a doubly MANOVA failed to reach a significant difference. However, the subsequent univariate analysis on the eleven subscales of SMS revealed statistically significant differences in the two subscales favoring anchored instruction condition, including interestingness and work avoidance1, indicating students' interest in curricular contents and learning activities increased and their work avoidance decreased during implementing anchored instruction.

Although the results of univariate analysis on separate subscales did not reveal substantial between-groups effects for two instructional groups, it is noteworthy that there was a significant within subject effects for time in the anchored instruction group. The results of within-group comparisons for the anchored instruction group indicated that

students' perceptions of task value, peer learning, subjective competence, and interestingness improved significantly on the posttest. In contrast, there was no significant difference between the pretest and posttest MSLQ scores in the non-anchored instruction. In addition, the univariate analysis of SMS revealed a significant effect between the pretest and the posttest only in performance orientation, higher in the posttest.

Furthermore, the overall motivational changes of the anchored instruction group over time were in a more desirable direction than that of non-anchored instruction group. The scores of positive motivation to learn increased on the posttest, such as intrinsic goal orientation, task value, control beliefs, and peer learning. In contrast, the scores of negative motivation to learn decreased on the posttest, such as extrinsic goal orientation and test anxiety. Figure 5.1 demonstrates the ways that students' MSLQ scores changed over the time in the anchored instruction group. This result suggests that students' motivation to learn changed positively with no evidence of negative consequences after implementing the anchored instruction.

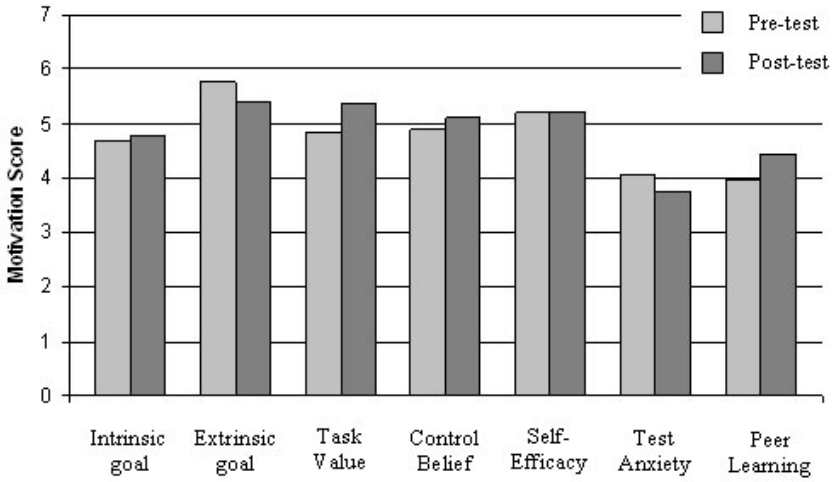


Figure 5.1 Anchored Instruction Students' Motivational Changes over Time.

In contrast, the non-anchored instruction students' MSLQ scores did not change considerably over time. Furthermore, the positive subscales of motivation to learn, including task value, control beliefs, self-efficacy, and peer learning slightly decreased on the posttest, even though the differences were not statically significant. Alternatively, the negative subscale of MSLQ, such as test anxiety increased on the posttest. Figure 5.2 presents the overall changes in motivation to learn of students in non-anchored instruction measured by MSLQ.

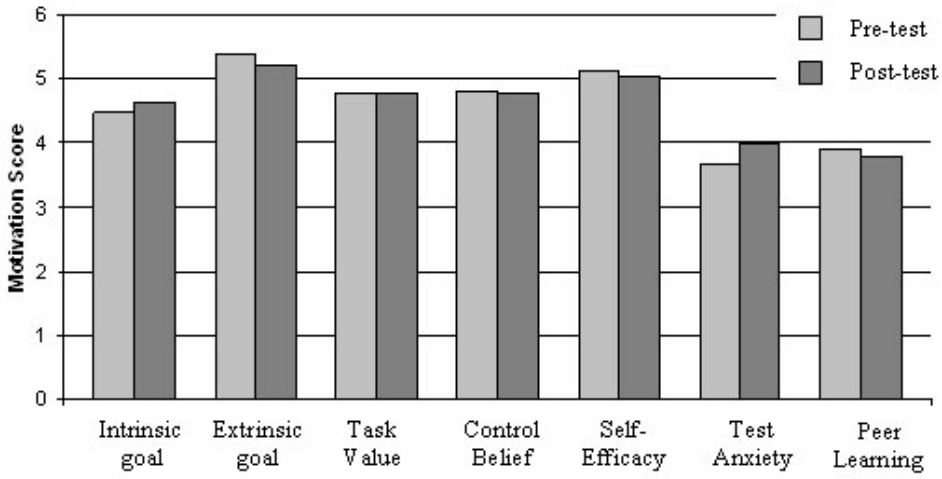


Figure 5.2 Non-Anchored Instruction Students' Motivational Changes over Time

One possible explanation for the increased test anxiety is that the non-anchored instruction teacher had regular vocabulary tests and quizzes to determine the final grade. Moreover, the results of assessments were posted on the classroom board. In contrast, the anchored instruction teacher graded student products, their presentations, and their engagement during small group activities. This finding supported that anchored instruction provided students with less competitive, less worrisome, and less anxious learning environment (CTGV, 1992).

The results from the between-groups and within-group comparisons identified several subscales of motivation to learn that improved significantly while receiving anchored instruction. They were peer learning, task value, interestingness, subjective competence, less work avoidance1, and performance orientation.

Peer Learning

As expected, the results of this study provided strong evidence that the anchored instruction students' perception of collaboration with peers was more positive than that of the non-anchored instruction students, F (1, 76) = 19.32, $p < .01$. While implementing the anchored instruction, the small-group activity was used as a primary instructional strategy. As described in chapter III, more than 90% of instruction during the five-week anchored instruction condition employed the small-group activities. This instructional principles and positive experiences of anchored instruction might impact on students' positive perceptions of peer leaning.

Indeed, creating effective group activity is not simply a matter of putting students together. Students do not automatically become more involved in small group activities. In the case of anchored instruction, the multimedia anchors helped small group members to share the contexts to become active participants (Kizer, Gabella, & Rieth, 1994). Besides multimedia anchors, anchored instruction provided students with a variety of small group activities, such as object box activity, preliminary and final group research, segmenting activity, and character analysis. The variety of small group activities enhanced group members' collaboration, communication, and responsibility while working as a group. When this occurred effectively in small group learning activities, students experience positive acceptance and encouragement which enhance motivation to learn from group members (Bossert, 1988-1989).

Many previous studies supported the positive effects of small-group activity on motivation to learn and academic achievement. For example, Johnson and Johnson (1979, 1999) compared classrooms that employed small-group learning approaches to those used individualistic approaches. The results of study indicated that small-group learning approach was more effective on student attitudes toward the subject matter and learning, feelings of social supports, and self-concept. The results of study by Rieth et al. (2003) clearly supported the positive impact of small group activities on students' motivation to learn. According to student interview data, students particularly liked the small-group research parts of anchored instruction, as they provided students with more opportunity to participate in discussion.

However, it should be noted that the increased small-group activities did not simply imply that the teacher's role diminished. On the contrary, teachers used time saved to provide in-depth guidance, to support a small group activity, and to monitor students' learning. Menin and Martinez-Burrola (1986) found that the teachers in the traditional teaching condition spent more of their time (61%) preparing for lectures than having actual contact with the students (39%). In the group-based PBL approach, the teachers spent 72% of their time in actual contact with the students.

Task Value and Interestingness

The results of MSLQ and SMS consistently indicated that anchored instruction was effective in improving students' understanding of task value and personal interest in particular domains or topics than those of non-anchored instruction group. As the task value of MSLQ included the personal interest (Pintrich et al., 1991), the interest of SMS could be discussed together. Indeed, task value of MSLQ failed to reach a statistically significant difference between the anchored instruction and the non-anchored instruction groups [F (1, 76) = 3.72, p = .057], even though it was significant at .10 alpha level.

However, within-group analyses of two experimental groups complement the results of between-group analysis.

The within-group analysis of the task value reported a significant difference between the pretest and the posttest in the anchored instruction group favoring the posttest. On the other hand, there was no significant difference between the pretest and the posttest in the non-anchored instruction group. These results indicated that the anchored instruction students became more likely to evaluate their leaning tasks as interesting, important, and useful than students in non-anchored instruction. This finding is consistent with theoretical assumptions of anchored instruction (CTGV, 1990). The findings reported by Xin and Rieth (2001) supported this result. They found that 85% students were highly pleased with anchored instruction and enjoyed learning vocabulary words. In contrast, to the students in the non-anchored instruction group, only 30% indicated that they enjoyed learning. There are several feasible reasons for the improved task value and interestingness in anchored instruction group.

First, the authentic nature of tasks and curricular contents in anchored instruction played a critical role in improving students' perceptions of task value and interestingness. In a traditional classroom, students were frequently given problems and tasks that are of little relevance and bear little meaning for them. In contrast, anchored instruction provided authentic tasks that are more likely to increase the personal relevance of the materials and activities. The teacher interview data reported by Rieth et al. (2003) support this rationale. A teacher reported, "the students had fewer questions or comments [such as] 'Why do we have to do this? What's the purpose of this?" (p. 179). Typically, these kinds of questions are asked when students do not know the value of tasks. In addition, the anchored instruction students better understood that the activities were the most

commonly encountered problem solution processes in ill-structured everyday practice (CTGV, 1993a).

To provide students with the authentic learning experiences, the tasks assigned in anchored instruction were open-ended rather than well-structured (CTGV, 1992; Rieth et al., 2003). Cohen's (1986) review of small group learning found that groups were not productive when tasks were closed with only one fixed answer to the question. In contrast, groups were more productive when tasks were open to multiple perspectives and solutions.

Second, the improved task value and interestingness might be partially due to the increased small-group activities. When students shared ideas, accommodated others' perspectives, and integrated group's whole ideas, they could better understand the value of tasks (CTGV, 1993a). This is also more likely to occur when tasks involve more than one right answer, not when students complete worksheets aimed at improving low-level skills or recall of information. When students connected their ideas and explained them to others or when students generated research questions and problem solutions based on information, they discussed and communicated more (CTGV, 1993a; Glaser, Rieth, Kinzer, & Peter, 1999). Constructive conversation provided students with opportunities to understand the value of and future utility of what they were learning (Ferretti, MacArthur, & Okolo, 2001). Consequently, this kind of activities contributed to enhancing their perspectives of task value.

Furthermore, while participating in anchored instruction, students had many opportunities to select research topics and the characters that were interest to them, rather than completing tasks assigned by the teacher. The opportunities for choice were one of the factors that promoted participation in the learning activities (Morgan, 2006). To promote students' choice on learning processes in the anchored instruction, students as a

group identified the specific scenes of DVD, the characters, and related research topics based on their preference, and they also selected problem solving strategies by their own choices. Some students gathered background information, some developed presentation material; PowerPoint, and others found supplementary information to enhance their products. This is a typical problem-solving process in a real word, which seemed exactly same with that of students understood.

Third, the use of technology in anchored instruction might have a positive impact on students' motivation to learn. While implementing the anchored instruction, students had many opportunities to access the Internet resources, PowerPoint, Inspiration, and DVD that students enjoyed using (National Technology Plan, 2005). For example, students were engaged in searching for information on the Internet to complete their research project. Small-group members shared their findings on their research topic and discussed the validity and reliability of discovered information. Then, they developed PowerPoint and Inspiration presentations that revealed the evidence from Internet, books, and the DVD to support their arguments. It was consistent with the student interview results reported by Rieth et al. (2003). Students reported that using technology including Internet and PowerPoint was a good way to learn and it was fun to use while implementing anchored instruction. The results also suggested that the opportunity to learn new computer programs, useful skills for searching for relevant information with their peers was interesting to them.

With regard to interestingness, many previous studies (Pintrich, Anderman, & Klobucar, 1994; Schraw & Lehman, 2004) demonstrated the positive impact of situational and personal interestingness on other kinds of motivation to learn and achievement. In particular, Hidi and Baird (1986) and Renninger, Hidi, and Krapp (1992) indicated that student's interestingness influenced their task choices, use of learning

strategies, decision of task value, and engagement into selected tasks. Students who had high interest were more likely to choose challenging tasks and to be engaged in deeper cognitive processing. Schiefele (1992) demonstrated that interest played more or equally important roles to students' prior knowledge level in achievement. In addition, the study by Schraw and Lehman (2004) revealed the importance of interestingness for academic choices and for self-regulated learning, in particular when the instruction were implemented based on student-directed learning as used in anchored instruction. Consistently, Rieth et al (2003) found that students' participation in classroom activities increased and their average attendance in class also increased while implementing the anchored instruction.

Subjective Competence

Findings regarding the improved subjective competence in the anchored instruction group were important because students with LD lacked the appropriate sources to form their competence in learning due to repeated failure experiences (Hampton & Mason, 2003). When students have high subjective competence, they would be more responsible for their performance and display higher levels of engagement, persistence, and effort (Maehr & Meyer, 1997).

Relative to the increased subjective competence, the learner-centered characteristic of anchored instruction seems to contribute to the improvement of students' subjective competence (Midgley, Kaplan, & Middleton, 2001). The anchored instruction provided students with enough opportunities to control their learning, including selecting preferring research topics and characters, managing team project schedule, controlling their time and efforts to meet the deadlines, and collaborating with peers to develop their products. In particular, the student in the anchored instruction was expected to be a knowledge producer, like a researcher and an expert in their field. For example, they

posed research questions, formulated hypotheses, and analyzed the hypotheses, and argued with others regarding the accuracy of their findings. In doing so, students took pride in their production and the learning experience, which were particularly important for students with LD to achieve subjective competence (National Research Council, 2000).

In particular, in small groups, students with LD had opportunities to learn learning strategies from their peers without LD, such as how to ask good questions, to search for relevant information, to provide evidence for their argument, to analyze the gathered information, to plan and monitor their learning process, and to share knowledge with peers (Rieth et al., 2003). A considerable number of studies supported the notion that strategy instruction improved students' motivation to learn (Meltzer, Katzir, Miller, Reddy, & Roditi, 2004; Miller, Meltzer, Katzir, & Houser, 2001; Pintrich, 2004; Pintrich & Schunk, 1996) and through the challenging and complex problem solving experiences, students improved their subjective competence of learning (CTGV, 1992).

Subjective confidence also improves when students better understand curricular content. In this study, students learned the content of Nightjohn a novel representing mid 19th century southern slavery. Without the aid of multimedia anchors, students may not have fully understood certain concepts and events described in the text. In the anchored instruction, the photographs and DVD provided students with the realistic contexts illustrating slavery life in the 19th century, an event far removed from the personal experience of today's' students, and one which would be difficult for students to comprehend without visualization tool such as video. Koschmann et al. (1994) suggested that a single mental perspective and method of approach is not sufficient for understanding the complex material of learning. Richness of concepts and information can be missed with single representations such as text, and the simplification may prove

misleading. To sum up, the better understanding of content knowledge improved students' subjective competence.

Performance Goal Orientation

The performance goal orientation score of SMS, which is known as negative motivation to learn, increased significantly after competing anchored instruction activities. Typically, students with high performance goal orientation focus on the learning outcomes and proving their ability relative to others (Pintrich, 1996). Although performance-oriented learning is associated with less adaptive patterns of beliefs and behaviors such as surface-learning strategies and lack of intellectual risk taking (Dweck, 1986; Pintrich, 1999), Midgley, Kaplan, and Middleton (2001) argued that high performance orientation also is associated with adaptive motivation such as increased self-efficacy and high task value. One possible explanation for the increased performance goal orientation during implementing anchored instruction is that students had more opportunities to share their ideas and products, such as PowerPoint and the posters with their classmates in the anchored instruction. They could increase students' performance goal orientation level. The results of study by Rieth et al. (2003) supported this rational. According to the teacher interview data, students wanted to share their research products with their classmates, rather than simply finish the research.

Interestingly, the increased performance goal orientation score in SMS measure conflicted with that of extrinsic goal orientation in MSLQ measure. The extrinsic goal orientation score decreased on the posttest. Typically, the extrinsic goal orientation suggests that students' extrinsic goals (e.g., grade, rewards, and recognition) play important roles in deciding their performance. One possible explanation of this discrepancy of the results between two measures is that the two motivation measures for extrinsic goal orientation and for performance goal orientation measured different

external factors that influenced the students' performance. To measure students' extrinsic goal orientation, MSLQ items asked more about the relationship between goal orientation and their grade (See Appendix D), such as "Getting a good grade in this class is the most satisfying thing for me right now." In contrast, SMS items concerned peer's perceptions on their performance, such as "I tried to make the others think I did a good job." Therefore, the results suggested that students' goal orientation during anchored instruction became more performance oriented with a goal to make their outcomes and their abilities look good to their peers, rather than getting a good grade.

Effect of Anchored Instruction on Motivation to Learn of Students with and without LD

The overall results of a doubly MANOVA demonstrated that there were no substantial differences in the effects of anchored instruction between students with and without LD. This finding is important because it implies that students with LD attainted similar levels of motivation to learn as their no-LD peers as a result of anchored instruction, which is based on the constructivist learning approaches. This finding refutes the argument that students with LD may not be sufficiently motivated to deal with complex tasks because they have specific learning challenges such as deficits in basic skills, meta-cognition, comprehension, and problem-solving skills (Poplin, 1988). On the other hand, this finding supported the argument that anchored instruction provides students with LD the opportunity to experience the real meaning and pleasure from learning (Glaser et al., 1999; Hasselbring & Moore, 1996; Hur, 2001).

Interestingly, the results of univariate analysis of SMS measure yielded significant differences in Work Avoidace1 between students with and without LD. Students with LD demonstrated less work avoidance while implementing anchored instruction. However, the mean score of students without LD on Work Avoidance1 slightly increased on the

posttest. It was expected, given that the anchored instruction activities were more complex and challenging than the non-anchored instruction activities (Hickey, Moore, & Pellegrino, 2001). Students with LD's decrease in Work Avoidance 1 may be explained because they were more actively engaged in work supported by a group of peers without LD. Giving help and seeking help happened frequently in small group learning. In particular, the help of their peers without LD would appear to be quite helpful to students with LD because their peers, typically high-achieving students, gave them elaborate explanations that clarified and organized their reasoning processes and the products.

However, peers help and support did not always benefit students with LD. Most importantly, students with LD might remain passive because they thought that their peers would produce better products thereby minimalising their contributions to the group (Nelson-LeGall, 1985). For example, when a group developed a PowerPoint presentation for the final research report, students sometimes did not share the tasks fairly. Typically, the high-achieving or forceful students did more than others. Consequently, students with LD had reduced tasks to complete that required less of efforts. They had no reason to avoid the tasks. However, fortunately, the data from both MSLQ and SMS consistently reported that the anchored instruction students with LD's intrinsic goal orientation increased on the posttest, although they were not statistically significant at .05 level. It suggested that students with LD participated in tasks for curiosity and mastery.

Effects of Anchored Instruction on Achievement of students with and without LD

The results of this study demonstrated that students in anchored instruction statistically outperformed students in non-anchored instruction on the curriculum-based academic achievement test. The effect size was large, partial $\eta 2$=.13. This is what might be expected, given the design principles behind the anchored instruction. It is an important finding because it supports the notion that integrating complex PBL-based

constructivist approaches with technology can be the effective way of enhancing students with and without LD's understanding of the novel in addition to improving their motivation to learn. In addition, the results of this study on the academic achievement demonstrated that student-lead learning produced similar or better academic outcomes than those of teacher-lead classes.

However, the results did not indicate the degree to which the enhanced motivation to learn contributed to the academic achievement due to the limited evidence of a relationship between the academic achievement and motivation level. In deed, many studies found the complex interactions among cognition, motivation, teachers' perception, and educational processes (Meltzer, Katzir, Miller, Reddy, & Roditi, 2004; Pintrich, 2003). The results of this study clearly implied that the motivationally rich instructional components that improved students' motivation to learn positively impacted on students' academic achievement as well. It would be more reasonable to argue that anchored instruction improved students' learning outcomes as well as motivation to learn, rather than improved motivation directly influences their achievements.

It is especially noteworthy that the two instruction groups were significantly different with the comprehension of main themes and character analysis favoring anchored instruction. However, the two groups were not different in the recall of information, understanding of social and historical contexts, and the total score. This result suggests that the anchored instruction helped students to learn the main themes and characters and how to analyze of the novel. This result reaffirmed the findings reported by Reith et al. (2003) and Xin and Rieth (2001) that anchored instruction provided students with a clearer understanding of the plot, characters, storyline, and word definition.

Furthermore, ANCOVA indicated that students with and without LD were not significantly different on the comprehension of the main themes and character analysis, F (1, 37) = 1.08, p = .31. This result suggested that students with LD benefited similarly from the anchored instruction when compared to their peers without LD. Moreover, the mean score of students with LD in anchored instruction (M = 5.35) was similar to that of students without LD in the non-anchored instruction group (M = 5.38) although it was less than that of students without LD in anchored instruction (M = 6.03). The students with LD in non-anchored instruction significantly less than others (M = 4.00). In contrast, the non-anchored instruction group students with and without LD demonstrated significant differences on the comprehension of main themes and character analysis.

Understanding themes and characters are regarded as high level cognitive tasks that are more difficult for students with LD, as they required higher level of comprehensions of the novel (Wong, 1980). Pearson, Hansen, and Gordon (1979) indicated that the comprehension of the main themes depend not only on students' reading skills, but also on the context that is embedded into the setting and events, of course these are well-known strengths of the anchored instruction.

The anchored instruction groups' successful knowledge gains especially in the complex areas may be due to the increased small-group collaborative learning activities. The well-designed small-group activities promote students' opportunities to improve their reasoning skills, integrating information skills, and critical thinking skills by perspective-taking and accommodation to others' ideas and products (Bossert, 1988-1989; Hur, 2001). During small group activity, students systematically develop alternative explanations for their tasks and provide evidences and rationale on their products. A number of studies demonstrated the positive effects of peer learning for students with LD

on their attitudes toward class and actual achievement (Elbaum & Vaughn, 2001; Trainin & Swanson, 2005).

In terms of the recall of the detailed information about the novel, both instruction groups made achievement gains. However, it should be noted that the non-anchored instruction group students had opportunities to read the novel as well as to watch the movie. Indeed, when text was combined effectively with visuals, the recall of information could more effective. Paivio's dual coding theory supports the multidimensional aspects of learning. Paivio suggested that two types of information (verbal and imagery) are encoded by separate subsystem. Watching the video and reading the novel seemed to be beneficial because two separated systems interconnected so that information was stored in both systems, enhancing a students' ability to remember and retrieve the information. In particular, it seems valuable to the students with LD who typically demonstrate poor literacy skills. However, the results of this study indicated that watching video after reading the book without related activities (e.g., segmenting in anchored instruction) did not significantly improve students' detailed recall of information.

Unexpectedly, the anchored instruction students' knowledge gains in the understanding of the historical and social contexts were lower than those attained by the control group students, even though it was not statically significantly. In particular, the score attained by students with LD indicated relatively larger mean difference between the two instruction groups. Previous studies have shown that anchored instruction has strength in providing the comprehensive contextual knowledge about the contents. Two explanations are possible for this unexpected result. First, it could be due to limited time allocation to discuss their understandings of social and historical background. Anchored instruction was designed as a six-week program, but only a five-week period was allowed in this study due to schedule of the statewide knowledge test. The anchored instruction

students accessed the Part C knowledge through a small-group activity and by individual research on the Internet resources and through books. However, they did not have enough time to elaborate their findings due to the limited time. To meet the school schedule, three to four days were only available for the final research activity during a five-week period. In contrast, the teacher in the non-anchored instruction group provided well-structured information on 19th century U.S. life and the southern slavery system, specifically related to the novel Nightjohn. Students could have acquired a more concrete understanding of social and historical background in a shorter time period than the anchored instruction students did.

Another possible explanation is that students' research topics selected during anchored instruction were about specific topics, rather than a comprehensive exploration of 19th century southern slavery life. Consequently, they selected specific topics that were interesting to them, and they went more in-depth about those topics. When searching the information, they focused on specific information that was useful for their research activity. Therefore, students could miss some parts of social and historical information. However, as teachers' responses on question items indicated, the question items for Part C required relatively comprehensive understandings about 19th historical and social background knowledge on slavery life (See Appendix F).

The results of this study on TOSCRF demonstrated that both anchored and non-anchored instructions were effective in improving silent reading fluency skills. It is an important finding because the teachers' common concern before implementing anchored instruction was that it did not provide students with opportunities to read the book. Moreover, the non-anchored instruction teacher provided the regular vocabulary lesson to improve students' reading skills. In contrast, the anchored instruction teacher did not specifically teach the vocabulary.

In this situation, the TOSCRF results implied that although the anchored instruction students did not read a book while implementing anchored instruction, they had other opportunities to read written documents, including Internet resource and the resource books. The TOSCRF scores of students with LD increased in a similar level with that of their peers with LD on the posttest. This is important as they progressed at a rate equal to non-LD peers. However, it should be also noted that the five-week experiment was not enough to capture the between-group differences in TOSCRF. In particular, reading fluency requires a long exposure to the instruction over prolonged periods (Trainin & Swanson, 2005). A longer period of implementing anchored instruction and non-anchored instruction may be needed for examining the effects of anchored instruction on students' reading fluency skills. However, the TOSCRF results are important because they demonstrated that the impact of anchored instruction was still meaningful for students with LD although the implementation of intervention was limited by short duration.

RESEARCH QUESTION 2: MOTIVATION DIFFERENCES BETWEEN STUDENTS WITH AND WITHOUT LD

To investigate the existing motivational differences in a 7th grade language arts class between students with and without LD regardless of experiencing anchored instruction, this study compared the pretests scores. Previous studies reported inconsistent evidence on the motivation of students with LD compared to their peers without LD. The MANOVA results indicated no significant differences between them. This finding implies that students with and without LD had similar levels of motivation to learn, including all subscales of MSLQ and nine of eleven subscales of SMS. As indicated in Table 4.25, students with LD and without LD did not differ in goal orientation, task value, control belief, self-efficacy, and test anxiety. In addition, their subjective

competence, relevance, interestingness, and learning orientation were not significantly different from their peers without LD. Students with and without LD showed significant differences only in work avoidance1 and performance goal orientation at the univariate analysis of variance.

These findings are consistent with the results reported by Pintrich, Anderman, and Klobuca (1994). They found that students with LD enrolled in an elementary resource room had similar levels of motivation in intrinsic motivation, self-efficacy, and anxiety. For those results, they rationalized that the context of instruction where the special education teacher provides individualized supports for them impacted on positive motivation to learn of students with LD. They argued the special education teacher could provide more-manageable reading tasks sequenced; from easy to hard. Therefore, students with LD did not have negative motivation about language arts class, although they made more external attributions to task and higher scores with assistance.

This present study extended Pintrich, Anderman, and Klobuca's findings by demonstrating the similar motivation patterns of 7^{th} grade students with LD in inclusive general education language arts class. Similar to the result of previous studies (Pintrich, Anderman, & Klobuca, 1994; Sideridis et al., 2006; Baker & Wigfield, 1999), students with LD in this present study attained higher performance goal orientation, which implies that students with LD worked primarily to perform well in the eyes of others. Consistently, Sideridis et al. (2006) and Hampton and Mason (2003) demonstrated that students with and without reading comprehension difficulties were not significantly different in self-efficacy, recognition, while they differed in curiosity, challenge, competition, and negative affect. Meltzer et al. (2000) also revealed that students with LD perceived themselves as motivated, hard-working, and academically competent. A study by Trainin and Swanson (2005) reported that students with and without LD do not differ

in motivation, including internal goals, external goals, task value, and control, even though the study was conducted with college students.

The findings of this present study are not well matched with the results of study by Sideridis et al. (2006) that demonstrated that self-efficacy measure produced accurate classification of students with LD, at greater than 90% in accuracy. In contrast, this study revealed that students with and without LD did not differ in self-efficacy for learning to read. However, the goal orientation measure results presented in this study were consistent with the Sideridis et al.'s study.

The results of this study revealed that students with LD had a higher tendency to work avoidance when assigned a challenging task. Previous studies indicated that when they faced challenging tasks, they exerted less effort, easily gave up the tasks, or relied on the assistance from others (Meltzer, Katzir, Miller, Reddy, & Roditi, 2004; Miller, Meltzer, Katzir, & Houser, 2001). The study by Pintrich, Anderman, and Klobuca (1994) reported similar findings as students with LD's earned higher scores on assistance component of motivation, indicating more reliance on teachers and peers. Related to this issue, the present study provided evidence from the increased peer learning score of students with LD in MSLQ while implementing challenging anchored instruction.

This current study also found that students with LD had a higher performance goal orientation compared to their peers without LD. Students with a high performance goal orientation focus on performing well because they see good performance as a means to obtaining extrinsic rewards from others. In a classroom setting, those students are concerned with being judged and showing evidence of ability by being successful. While students with a learning goal orientation are not concerned with making mistakes and persist in their efforts even if they fail, students with a high performance goal orientation persist only when they perceived themselves as competent (Dweck, 1986; Dweck &

Leggett, 1988). It is not clear why students with LD showed a high performance orientation in this current study. Dweck (1986) explained that students' performance orientation increased when teachers or parents paid attention to what students did on a regular basis. It motivates them to "look good" on their performance. As teachers and parents concerned about students with LD's performances, they often monitor students' with LD' progresses. As a consequence, students with LD performance orientation increased.

To sum up, the overall results of this study indicated that students with LD could not be differentiated significantly from their peers without LD by motivational variables. However, this finding should be interpreted cautiously for two reasons. First, there was a limited sample of students with LD. More importantly, many studies of students with LD were concerned about accurately evaluating and judging their personal capabilities (Klassen, 2002; Stone, 1989; Stone & May, 2002). The results of a study by Klassen (2002) indicated the possibility that students with LD evaluated their degree of motivation to learn inaccurately as due to a lack of self-knowledge. It is often for students with LD to have difficulties with self-awareness skills, partly due to the deficiency in metacognition (Pintrich, Anderman, & Klobucar, 1994; Wong, 1987). Klassen's study reviewed 22 studies exploring the self-efficacy of students with LD. The results revealed that students with LD appeared to optimistically judge their self-efficacy particularly in writing, despite the students being identified with LD in writing. However, it was not clear about students with LD' accuracy in judging their efficacy in reading because self-efficacy is not consistent in across subject matter (Klassen, 2002).

The results of this present study provided limited evidence about this issue. For example, the pretest scores on TOSCRF and CCTT yielded significant differences between students with and without LD. However, their general motivation scores were

similar. Additional evidence is provided by the relationship between students' motivation to learn and achievement presented in Table 4.28. The patterns of correlations for students with LD were not wholly consistent with the theoretical assumptions. For example, the students LD's task value and control belief were correlated negatively with achievement scores. Typically, students with higher task value and control belief attain higher achievement scores (Pintrich, 2003). Another example is that students with LD who had higher Work Avoidance scores earned higher achievement score. In contrast, the correlation patterns of students without LD were consistent with the theoretical assumptions of motivation scales. Short (1992) and Miller et al. (2001)'s findings provided additional evidence regarding the significant differences between students self-report and teacher report data on motivation to learn. Students' self-rating of their motivation to learn was higher than the ratings of their teachers, indicating students' overestimation of their academic performance and motivation to learn. To confirm the effects of anchored instruction on students with and without LD, future studies need to employ teacher-rated data collection. Interestingly, the inflated self-perceptions of students with LD partially contributed to students' successful school life, although they were due to their misjudgment of self-capabilities. Meltzer et al. (2004) argued that the inflated self-ratings of students with LD preserve their academic self-esteem, motivation to learn, and working hard with challenging tasks. Stone and May (2002) interpreted this inflated self-perceptions as the tendency toward self-protection of students with LD.

RESEARCH QEUSTION3: RELATIONSHIP BETWEEN MOTIVATION LEVEL AND ACHIEVEMENT

This study explored the relationship between the curriculum-based achievement and students' motivation level because it is widely accepted that students' motivation to learn interact with teachers' perceptions and expectations to mediate academic

performance (Hampton & Mason, 2003; Meltzer, Miller, Katzir, & Roditi, 2000; Stone & May, 2002). However, the results of this study revealed that the relationship between motivation to learn and achievement were not substantial, simple, and direct. In particular, students with LD's correlation data were more complex than students without LD (Baker & Wigfield, 1999;Sideridis et al., 2006). In addition, their overall correlation coefficients were smaller than students without LD. One plausible explanation for the weak correlations is that students with LD had level of motivation similar to their peers without LD, however, their achievement level was lower than that of peers without LD. Furthermore, students with LD have tendency to optimistically judge their motivation to learn despite their achievement scores were low. However, the results of this present study revealed several meaningful findings abut relationship between students' motivation to lean and achievement.

First, self-efficacy and subjective competence were significantly correlated to the academic achievement scores. This suggested students' self-efficacy and subjective competence are more predictive of their academic achievement. This pattern of relationship is consistent with theoretical assumptions about the consequences of self-efficacy (Bandura, 1982; Hampton & Mason, 2003).

Self-efficacy and subjective competence refer to students' beliefs in their capability to successfully perform specific tasks in specific situations to produce results (Bandura, 1997). This belief influences students' learning performance, including choice of tasks and activities, engagement into activities, completion of challenging tasks, use of higher level of learning strategies, and level of effort. When students lack a sense of efficacy or subjective competency, they are likely to show maladaptive behaviors, such as avoiding challenging activities (Schunk, 1989). Consistently, in this study, self-efficacy

and subjective competency were related to the more complex components of the achievement test, such as the understanding the main themes and characters.

Interestingly, for students with LD, work avoidance was significantly negatively correlated to the scores of this difficult part, r = -.44, indicating that students with LD who did not avoid work were likely to earn the higher scores on the difficult parts of the test. Because of students' with LD's lack of metacognitive skills and advanced learning strategies, they need to exert more effort than their peers without LD in order to achieve same level of academic success. The results are consistent with the findings reported by Baker and Wigfield (1999) indicated that work avoidance was related consistently to students' performance and disengagement.

The achievement test scores earned on the social and historical understanding of the novel, task value and self-efficacy were significantly correlated. The results are consisted with the previous studies on the effects of anchored instruction (Ferretti, MacArthur, & Okolo, 2001; Okolo & Ferretti, 1996), indicating that students' perceptions of task value and self-efficacy influenced achievement. In this study, Part C of the curriculum-based achievement test measured students' comprehensive understanding of the social and historical background associated with the novel, which required more active communication with peers and searching for related resources, such as reading related books and searching Internet resources. As predicted, Part C was positively correlated with distributed activity1 (r = .24) and distributed activity 2 (r = .18) at the .05 significant level. Distributed activity implied the extent to which students relied on and helped each other.

SUMMARY OF THE EFFECTS

This study found that anchored instruction is an effective instruction for 7th grade students with and without LD in an inclusive general education language arts class by

improving their motivation to learn and academic achievement. Students in anchored instruction reported higher level of peer learning, interestingness, and less work avoidance than non-anchored instruction students did. In addition, the results of within-group analysis demonstrated that the anchored instruction students' scores of task value, peer learning, subjective competence, interestingness, and performance orientation changed significantly after completing the anchored instruction. Moreover, students with LD who received the anchored instruction improved their motivation to learn and academic achievement to a level similar to students without LD.

These results were due to the multimedia video anchors, authentic tasks and learning activities, and sufficient collaborative learning activities implemented in the anchored instruction. These characteristics of anchored instruction could facilitate use of effective learning strategies, promote discussion and communication when working as a group, and provide chances to control their learning activities. The overall results of this study suggest that anchored instruction is an effective approach that integrates technologies into the classroom learning as a medium for enhancing students' motivation to learn and academic achievement.

The results of this study also found that 7th grade students with and without LD had the similar motivation patterns in language arts class although students with LD had higher tendency of work avoidance and performance goal orientation. Consistently, previous studies indicated that when students with LD faced challenging tasks, they easily give up the tasks and they concerned with being judged by others. In terms of the relationship between the curriculum-based achievement and students' motivation level, the results of this study provide limited evidence. Students with LD showed a different motivational pattern of relationship, when compared to students without LD. It is partly

due to their inaccurate self-evaluation. In addition, self-efficacy and subjective competence are predictive of students' academic achievement.

IMPLICATIONS FOR PRACTICE

Motivating students with LD in a general education classroom is a practical concern for teachers. National survey results indicated that teachers are struggling to provide students, especially students with LD, with learning conditions that aim to develop motivation to learn. This is due to the lack of available materials, limited knowledge on alternative interventions to employ, and a large number of diverse students in a class (Wehmeyer, Agran, & Hughes, 1998). The results of this present study provided several practical implications for the teachers who are interested in improving students' motivation to learn in a general education language arts class.

First, the multimedia-based anchored instruction is more likely to be successful in a regular classroom because it does not conflict with typical class organization and teachers' roles including whole class instruction, small group work, and written seatwork. This may be an important characteristic that differentiates anchored instruction from computer assisted instruction, which requires specific equipment, space, materials, and a radical change in the teachers' role. Furthermore, anchored instruction can be successfully combined with other effective interventions while implementing the anchored instruction, such as direct instruction and peer tutoring for students with LD.

In particular, the anchored instruction employed with a variety of small group activities that the National Research Council (2001) strongly recommended to improve students' academic accomplishments and motivation to learn. Regardless of the subject matter, students working in small groups tended to learn more of what was taught and retained it longer than when the same content is presented in other instructional formats.

In addition, students who worked collaboratively in a small group were more satisfied with the classes (Jonassen, 2000).

Anchored instruction is especially effective for teachers who want to promote the students' active participation in high quality class discussion because the multimedia anchors help students and teachers to share the common contexts and experiences for discussion. As Xin and Rieth (2001) indicated, teachers can use more contextualized events, vocabulary words, and themes during discussion. This activity may increase the interactions between the teacher and students in class, which enhanced students' critical questioning and thinking skills for students with LD during discussion (e.g. Hur, 2001).

Second, considering the limited amount of instructional time available in a general education classroom setting, finding adequate teacher time to support individual students with LD is a challenge. Given these circumstances, anchored instruction seems to be a feasible solution. The present study and Hur (2001) revealed that despite a significant decrease in teacher-lead instructional time, replaced by the small group activities, students' motivation to learn, the curriculum-based achievement score, reading fluency score, and critical thinking skills improved to levels that exceeded the non-anchored instruction group. In terms of students' satisfaction, Rieth et al. (2003) also provided evidence that students in the anchored instruction were more satisfied with learning experiences than students receiving typical instruction. Using the saved time, teachers can spend more time providing individualized supports to students with LD.

Third, anchored instruction is especially useful when teachers taught classes that consisted of students with poor literacy skills, English as a second language learner, and students from different cultures. Those students commonly need additional support to compensate for their poor literacy and to understand situations outside of their personal

experience. To assist these students, teachers can use multimedia anchors to provide multiple representations of knowledge and multiple perspectives about information.

As a trade off, anchored instruction's advantages required teachers to be familiar with many instructional principles of constructivist approaches to learning. Many reviews of literature (Clark, 1994; Kozma, 1994; Maccini, Gagnon, & Hughes, 2003; Woodward & Rieth, 1997) shared the understanding that the video anchor itself is not a key factor in improving motivation to learn and academic achievement without employing effective instructional principles like anchored instruction. Indeed, creating a contextualized learning environment, assigning authentic tasks, and teaching basic technology skills for students' multimedia presentations in school settings are not easy tasks for teachers. Furthermore, appropriate scaffolding during intervention requires teachers to have the ability to monitor students' learning progress and determine when students need assistance. For example, off-task behaviors increase when students with LD perceive the given tasks are overly difficult for them. At this point, teachers should provide them sufficient supports to sustain their motivation to learn.

As a consequence, professional development programs should be provided for teachers who are interested in implementing technology-based instruction, such as anchored instruction. At the most general level, there should be ongoing training and feedback for teachers who would like to implement anchored instruction. The simple way is to provide training materials such as lesson plans and web-based training materials that teachers can easily access. The professional development programs should include demonstrations of the ways to implement anchored instruction in the classroom, including the ways of applying constructivist instruction principles and student-centered instructional philosophy. Then, teachers should have opportunities to be observed as they implement the anchored instruction to determine whether the ways are well aligned with

the original design purposes. Considerable supports may be required for teachers to be able to maximize their effectiveness with the new technology integrated anchored instruction, especially when they are relative novices in their use (CTGV, 1992). In addition, considering often innovative instructional practices remain only in the schools directly involved in the research (Buzhardt, Greenwood, Abbott, & Tapia, 2006), further study should investigate the scalability processes and strategies of anchored instruction, including teachers and schools' difficulties in implementing anchored instruction.

LIMITATIONS

Several limitations and concerns apply to this study. First, small numbers of students with LD were included in this study. 14 students per instruction group were not enough to obtain sufficient statistical power. Further study could help clarify the present findings with an larger sample size of students with LD. Relative to the student participants, this study investigated the motivational responses of only students with LD. Future studies could expand the findings by employing a wider range of students with disabilities, such as students with behavioral disorders and students with ADHD.

Second, a further limitation is the teacher confounding effects. The confounding teacher effect with an intervention approach could be one of the threats to an intervention study (Gersten, Baker, & Lloyd, 2000; Wolins, 1982). To minimize confounding teacher effects, more teachers per condition are necessary. Interestingly, Hickey, Moore, and Pellegrino (2001) reported that the Jasper activities did not enhance students' motivational beliefs. This however conflicted with the previous studies (CTGV, 1992). They argued that the positive motivational effects of the previous studies may have been due to teacher attitudes and their high implementation fidelity level, enthusiastic instructional practices, rather than the programs themselves. Therefore, additional studies

with more teacher participants are required to determine the generality of the findings of this study.

Third, anchored instruction was designed as a six-week program. However, in this study, it was implemented for five-weeks due to a modification in the school schedule. Consequently, students' time for the group research was not sufficient. Although the results of a curriculum-based achievement in understanding of social and historical contexts of the experimental students with and without LD improved, their outcomes were not as positive as the researcher hoped. Furthermore, students with LD had more difficulties. Therefore, it is essential to provide students with LD with explicit guidelines for research themes and ways of providing individualized feedback for them during research activity need to be investigated. Future studies may provide rich information on the advantages, limitations, and ways of overcoming the limitations of constructivist instructional approaches for students with LD.

Relative to measures on the students' motivation to learn, this study employed self-report methods, which require learners to indicate their perceived motivational level. Typically, these methods capture recalled actions rather than ongoing activity. The study by Short (1992) revealed the significant differences between students self-report and teacher report data on motivation to learn. Typically, the results of the teacher ratings yielded more significant differences between students with and without LD. Future study of the effects of anchored instruction need to employ teacher report data. Future studies also can take into account students' data about student performance and behavior. Indeed, students' behaviors can provide a more accurate measure of motivation to learn. To date, most of the previous studies that collected students' performance data focused on questioning and answering related behaviors or on-task behaviors. Future studies need to develop alternative instruments for collecting data on students' motivation to learn. For

example, analyzing students' note-taking based on the perspectives of motivation to learn seems possible. The analysis of note-taking as a product of PBL in a natural environment may explain the process of students' motivation improvement based on individual activities students participate.

Finally, the dominant research approach including this study to anchored instruction has been a systemic approach. Therefore, it is hard to decide what instructional variables and components contributed to the motivational effectiveness of anchored instruction. Although traditional analytic methods are often not amenable for studies of classroom-based interventions due to the complications (Salomon, 1991), future studies need to find the variables or components of intervention which are more critical to the motivational effectiveness of the intervention.

CONCLUSION

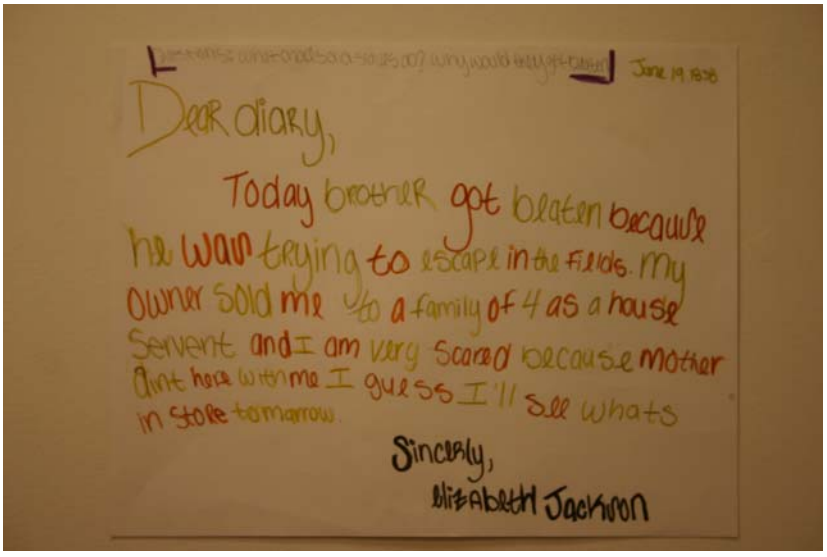
This study provided evidence that anchored instruction was an effective instruction for 7th grade students with and without LD in inclusive general language arts class. This demonstrated the students' improved motivation to learn and increased understanding of the contents. Therefore, this study fills in some of the research gaps in the anchored instruction studies by systematically examining the effects of anchored instruction on motivation to learn in language arts class. It is the first comprehensive study at the middle school level conducted in inclusive general education language arts classes to focus on the effects of anchored instruction. Moreover, it studied a variety of motivational measures and their relationship with the academic achievement in which the data for students with LD were disaggregated from the data for students without LD.

Appendices

APPENDIX A. STUDENT WORK SAMPLES

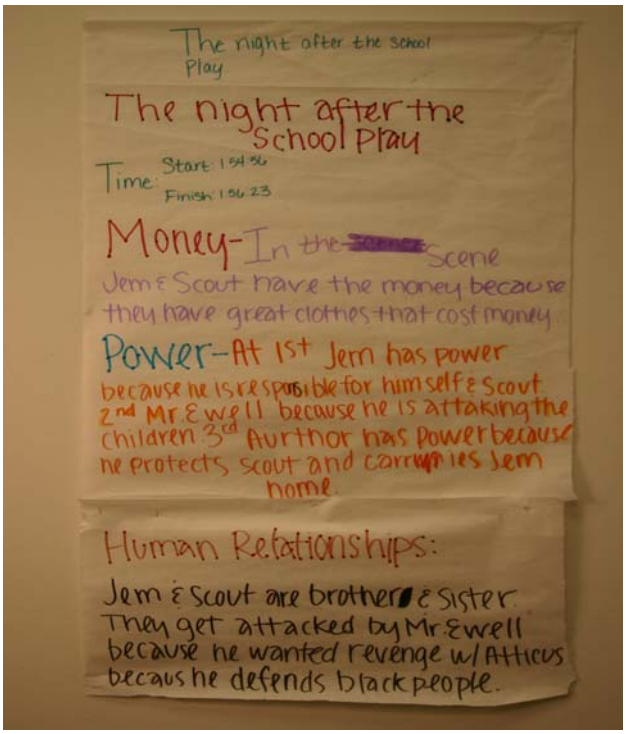
Phase 1: Object Box

Phase 1: First Research

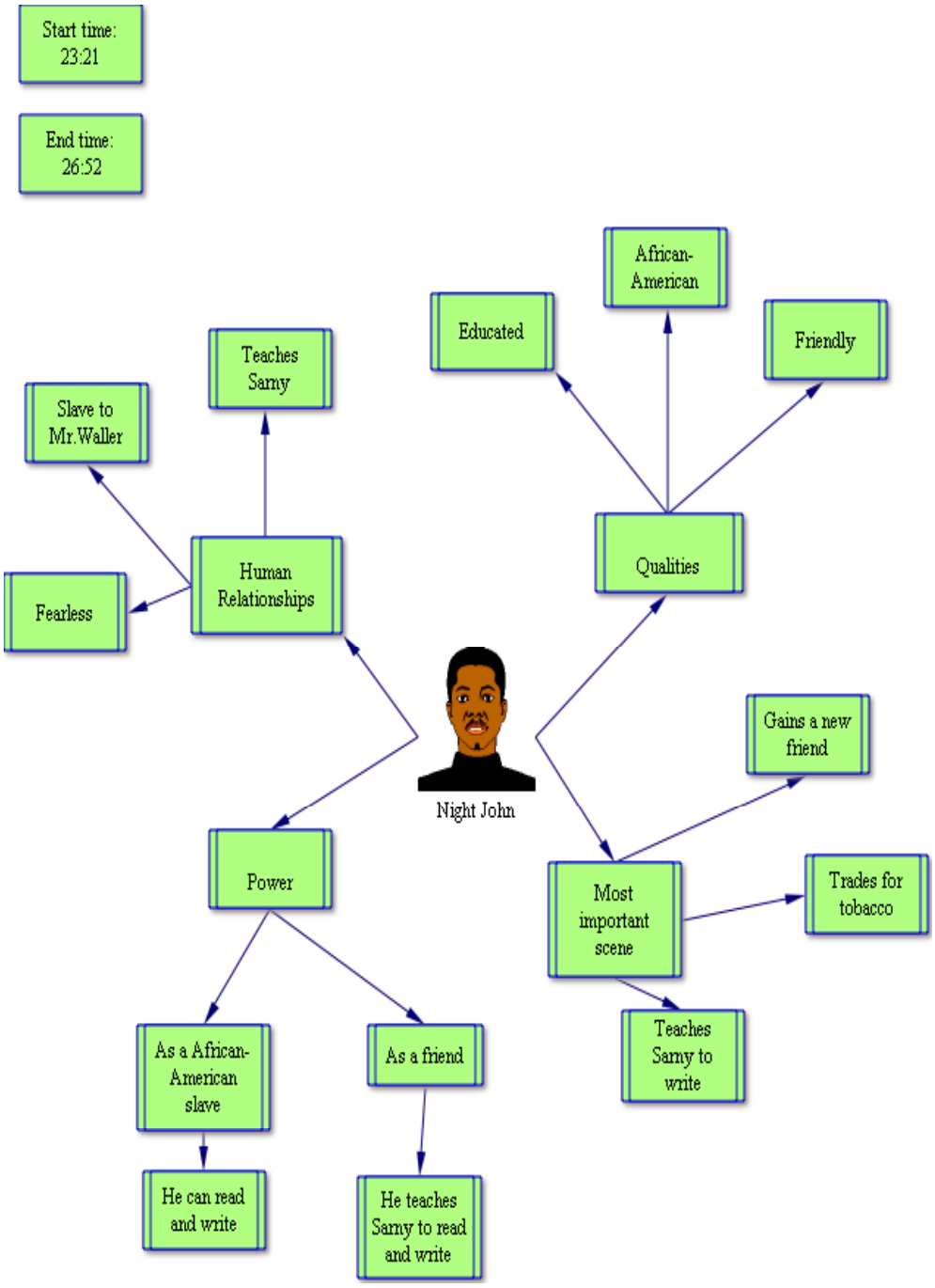


Phase 2: Retelling

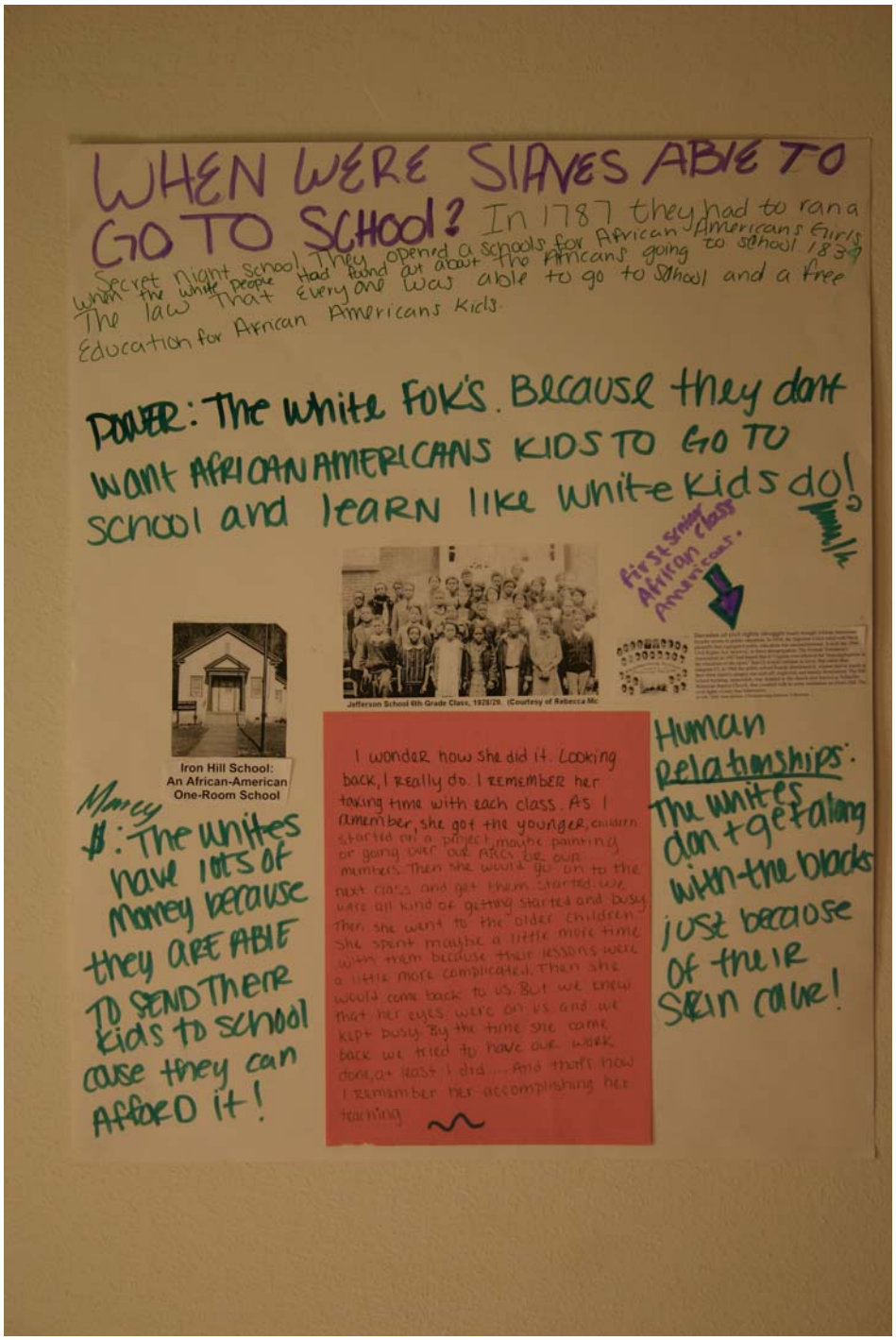
Phase 3: Segmenting Sample from To Kill a Mocking Bird Curriculum



Phase 4: Characterization



Phase 5: Final Research



APPENDIX B. TEACHING BEHAVIOR OBSERVATION SYSTEM

Date_____ Observer_____Teacher_____ Class Period _____

Instructional Time

Lecture

1_____2_____3_____4_____5_____6_____

Written Seatwork

1_____2_____3_____4_____5_____6_____

Discussion

1_____2_____3_____4_____5_____6_____

Reading

1_____2_____3_____4_____5_____6_____

Classroom Management (Transitions, Passing materials, Teacher directions)

1_____2_____3_____4_____5_____6_____

Behavior Management

1_____2_____3_____4_____5_____6_____

Field Note.

APPENDIX C. IMPLEMENTATION FIDELITY CHECKLIST

Phase 1: Day 1 - Introduction

Teacher's Planned Activities	NA	Yes	No	Engagement level (1-3)
Students learn about the purpose of the anchored instruction lesson				
Teacher asks students to describe their thoughts about going to the movies and seeing books that they might have read turned into movies. Teacher asks them to describe what appeals to them about video and movies				
Students learn how to conduct interviews and to ask good questions				
Teacher shows the students a tentative timeline of the activities for the next few weeks				

NA: Not applicable for the lesson. No: No includes "not enough time" compared than planned.
Student engagement level:

1. More than 1/2 of students engaged in off-topic conversations, staring out the window, playing with materials etc.
2. More than half of the students are actively engaged in the learning activity.
3. Almost all of the students are actively engaged in the learning activity.

Phase 1: Day 2 - Learning How to Interview

Teacher's Planned Activities	NA	Yes	No	Engagement level (1-3)
Teacher shows video anchor depicting the scene where shows important objects in a movie.				
Teacher asks students to bring in boxes that contain objects that best represent themselves. Teacher asks students to brainstorm about possible items to include in their boxes.				
Teacher models object box activity by assembling a personal object box, or by emptying select items from the teacher's purse or backpack and asking "What do these items tell you				

Phase 1: Day 3 - Learning How to Interview

Teacher's Planned Activities	NA	Yes	No	Engagement level (1-3)
Students bring their object boxes				
Teacher divides students into groups of three				
Teacher assigns students the following roles: recorder, question asker, responder. Each group member serves in each role once.				
Students begin by questioning another student about their object boxes. Teacher allows approximately 10 minutes per person.				
Once the small groups of three have finished questioning, teacher joins each group to another group of three (total group of six). Teacher asks the group of six to record their responses to the following questions: What type of questions gave you the most information about a person? Why?				

Phase 1: Day 4 - Learning How to Interview

Teacher's Planned Activities	NA	Yes	No	Engagement level (1-3)
Teacher shares the information they have learned about asking questions for information as whole class discussion.				
Teacher list and describes the types of questions that were most effective in obtaining detailed information about a person as whole class discussion. What types of questions were ineffective? Why?				

Phase 1: Day 5 - Learning How to Research

Teacher's Planned Activities	NA	Yes	No	Engagement
Teacher distributes photograph notebook to each group and asks students to open to the photograph by "Slave Market" by Boulanger (1882).				
Teacher tells the students to think of the photograph as if it was an object box.				
Teacher asks them to generate questions about elements in the photo like they did yesterday with their character boxes.				
Teacher records student questions on the board. Teacher discusses as a class which questions are "the best" research questions.				
Teacher divides students into groups of 5. Teacher asks each group to choose the question that interests them the most to research				
The group needs to appoint a recorder. It is the recorder's responsibility to record the group's questions generated during the research process as well as take notes on the process the group uses to research its question.				
Each group develops 2 products to answer their research question about the photograph. They research their question using the other photographs in the notebook and the materials from the library cart to create a structured presentation that "answers" their question.				
Teacher shows students available resources about the 1800s from the library cart. Teacher asks students to explore these resources to answer their research question about the photograph.				

Phase 1: Day 6 - Learning How to Research

Teacher's Planned Activities	NA	Yes	No	Engagement level (1-3)
Students continue researching their questions about the 1930s to create their presentation				
In groups of 5, students will explore one question about the photograph, "Slave Market" by Boulanger (1882). They will research their question to create a structured presentation that "answers" their question. Students use the resources listed in materials to research their question and to create a presentation of their findings.				
Teacher shows students available resources from the 1800s. Ask students to explore resources to answer questions about the photograph.				
The group needs to appoint a recorder. It is the recorder's responsibility to record the group's questions generated during the research process as well as take notes on the process the group uses to research its question.				
The group works together to develop a presentation. Technology presentations may be developed using PowerPoint. If technology is not available, students may use markers and poster board to display their findings.				

Phase 1: Day 7 - Demonstrating Research

Teacher's Planned Activities	NA	Yes	No	Engagement level (1-3)
Students present their research to the class. If posters have been developed, then they should be displayed.				
After each presentation, roles switch so that each group member has an opportunity to present.				
During the presentation, students must explain the question they chose to explore, their findings (research) and how they chose to represent their findings				
They must also explain their research processes.				
Students ask the presenter questions about his or her presentation				

Phase 1: Day 8-9 - Transitioning to the Anchor

Teacher's Planned Activities	NA	Yes	No	Engagement level (1-3)
Following student presentations, return to the photograph. Teacher asks questions.				
Teacher introduces the topics/themes of money, human relationships, and power				
Teacher asks students to share their reactions to the presentations. Why did you choose a particular question? What "objects" did you choose to represent that question? Why? What have you learned about life in the U.S. at this time? What other questions do you have that you didn't have time to explore or would like to explore further?				
Teacher introduces the video anchor and students watch the video anchor				

Phase 2: Day 10 - Retelling the Story

Teacher's Planned Activities	NA	Yes	No	Engagement level (1-3)
Teacher introduces the movie. Teacher asks students to refer to their questions about the video anchor they viewed yesterday. Then, teacher asks students to watch the movie keeping issues of money, power, and human relationships in mind.				
Teacher prepares students for upcoming activities by telling them that they will be asked to retell the important events in the movie				
Teacher asks students to retell what has happened in the movie so far. Teacher models how to retell a small portion of the beginning of the movie to help students understand how to retell.				
Teacher records student responses on sentence strips. Teacher explains to the students that by recording the main ideas of the movie now, they will be able to refer to them later.				
Teacher posts sentence strips around the room to create a visual reminder of the movie events. The sentence strips will remain posted until all activities have been completed				

Phase 1: Day 11-13 -Viewing the Anchor/Retelling the Story

Teacher's Planned Activities	NA	Yes	No	Engagement level (1-3)
Students will watch the movie to its conclusion over a period of days				
Teacher asks students to summarize the movie events from yesterday, using the sentence strips as prompts.				
Teacher stops the film before the end of each class, leaving time to retell the portion of the movie that students viewed during that period.				
For the last day, teacher finishes watching the film from just before the anchored scene.				
After the entire movie has been viewed, teacher conducts a class discussion of the film. Teacher records important student questions on sentence strips for easy reference later.				
Teacher continues retelling from yesterday. Teacher asks students to continue retelling the scenes from the movie. Teacher records student responses on sentence strips. Arrange strips sequentially around the room, with main ideas on top strip, supporting details below.				

Phase 3: Day 14-16 - Segmenting

Teacher's Planned Activities	NA	Yes	No	Engagement level (1-3)
Teacher teaches students how to use the DVD player. Teacher chooses one student out of each group and demonstrates how to use the player. Each group member will then show his/her group how to use the player.				
Teacher tells students that they will segment the movie so that they become familiar with the movie and can access the movie easily later as they do research.				
Teacher models segmenting by choosing a scene that illustrates an instance of money, power, and human relationships				
Teacher asks students to suggest scenes from the movie that best illustrate the movie's characters in terms of money, power, and human relationships.				
Teacher breaks the students into small groups. Each group should have their own copy of the DVD and a DVD player.				
Each group begins to identify scenes that reflect the important themes, and key events. Students should record the beginning and ending times for their scenes.				
Ideas regarding how the scenes reflect money, power, and human relationships are recorded on poster size paper. Small groups name scenes and each group may name scenes.				
Students may present their findings to their classmates by showing their clip and sharing their poster, and discussing how their scene exemplifies the themes of money, power, and human relationships.				

Phase 5: Day 16-18 - Characterization

Teacher's Planned Activities	NA	Yes	No	Engagement level (1-3)
Teacher explains to the students that they will use video segments to develop portraits of important characters in Nightjohn. Teacher asks the class to orally identify the main characters of Nightjohn.				
Teacher explain that students will choose a character, and working in groups, will find the most important scenes for that character that reveal the themes of money, power, and human relationships.				
Teacher models how to create a character web and how to find scenes using film segments.				
Teacher asks students to choose the character they would like to research. The number of students in each group will depend on the number of characters students select to research.				
If integrating technology, have students use Inspiration software to develop character webs, one per group.				
For projects without technology, distribute poster board and markers for students to create character webs.				
Groups will take turns using DVD players to find the most important scene(s) for their character.				
Once students have completed their research about their characters, they will present their character to the rest of the class.				

Phase 5: Day 19+ - Research

Teacher's Planned Activities	NA	Yes	No	Engagement level (1-3)
Teacher refers back to student questions about the film generated during the class discussion after finishing the film.				
Teacher tells students that they will use Nightjohn as a tool to research their questions, just as they used the film to explore a character. They will attempt to answer their research question using the movie and outside resources, including the internet and library books.				
Teacher asks students to choose their favorite questions, then chunk or categorize the questions to create 5-10 meaningful research questions. Students will choose the question they wish to research.				
Teacher models this by choosing a simple question from the film. Teacher shows the scene from the film where this is evident.				
Teacher shows students internet resources where they can go to answer their research question, including sites that share interviews with people who were alive during that time, music, poetry, etc. Teacher reminds students that they can use the photograph notebooks and books from the library cart to assist in their research too.				
Teacher asks students to use Nightjohn to give evidence to support their question They would pull evidence from the movie to support their question.				
Once students have established a basis for asking their questions, they are ready to begin their research.				
Teacher refers to questioning activities from the beginning of the project.				
Teacher encourages students to use all available resources to find the answers to their questions including the internet, phone and personal interviews with community members who lived during that time, etc.				
Teacher helps students create a way of demonstrating what they've learned, and how they've answered their question. They may want to present their findings to parents or to the school				
For projects without technology, distribute poster board and markers for students to create character webs.				
Groups take turns using DVD players to find the most important scene(s) for their character.				
Once students have completed their research about their characters, they present their character to the rest of the class.				

APPENDIX D. SELF-REPORT QUESTIONNAIRES

MOTIVATION TO LEARN I: MSLQ

Direction: This questionnaire asks you about your motivation to learn during Nightjohn curriculum (or project). **THERE IS NO RIGHT OR WRONG ANSWER TO THIS QUESTIONNAIE. THIS IS NOT A TEST.** We want you to respond to the questionnaire as accurately as possible, reflecting your own attitudes and behaviors during Nightjohn curriculum in this language arts class. If you think the statement is **very true of you, circle 7; if a statement is not at all true of you, circle 1. If the statement is more or less true of you, find the number between 1 and 7 that best describes you.**

1 2 3 4 5 6 7
not at al true of me **very true of me**

During learning Nightjohn…

1.	In a class like this, I prefer class material that really challenges me so I can learn new things.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2.	If I study in appropriate ways, then I will be able to learn the material in this class.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
3.	When I take a test I think about how poorly I am doing compared with other students.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
4.	I think I will be able to use what I learn in this class in other classes.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
5.	I believe I will receive an excellent grade in this class.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
6.	I'm certain I can understand the most difficult material presented in the readings for this class.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
7.	Getting a good grade in this class is the most satisfying thing for me right now.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
8.	When I take a test I think about items on other parts of the test I can't answer.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
9.	It is my own fault if I don't learn the material in this class.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
10.	It is important for me to learn the class material in this class.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
11.	The most important thing for me right now is improving my overall grade point average, so my main concern in this class is getting a good grade.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

12. I'm confident I can learn the basic concepts taught in this class.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
13. If I can, I want to get better grades in this class than most of the other students.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
14. When I take tests I think of the consequences of failing.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
15. I'm confident I can understand the most complex material presented by the teacher in this class.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
16. In a class like this, I prefer class material that excited my curiosity, even if it is difficult to learn.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
17. I am very interested in the content area of this class.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
18. If I try hard enough, then I will understand the class material.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
19. I have an uneasy, upset feeling when I take an exam.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
20. When studying for this class, I often try to explain the material to a classmate or a friend.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
21. I'm confident I can do an excellent job on the assignments and tests in this class.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
22. I expect to do well in this class.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
23. The most satisfying thing for me in this class is trying to understand the content as completely as possible.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
24. I think the class material in this class is useful for me to learn.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
25. When I have the opportunity in this class, I choose class assignments that I can learn from even if they don't guarantee a good grade.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
26. If I don't understand the class material, it is because I didn't try hard enough.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
27. I like the subject matter of this class.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
28. Understanding the subject matter of this class is very important to me.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
29. I feel my heart beating fast when I take an exam	**1**	**2**	**3**	**4**	**5**	**6**	**7**
30. I try to work with other students from this class to complete class assignments.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
31. I'm certain I can master the skills being taught in this class.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
32. I want to do well in this class because it is important to show my ability to my family, friends, or others.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
33. Considering the difficulty of this class, the teacher, and my skills, I think I will do well in this class.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
34. When studying for this class, I often set aside time to discuss the class material with a group of students from the class.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

MOTIVATION TO LEARN II : SMS

If you strongly agree to the statement**, circle 5; if a statement is not at all true of you, circle 1. If the statement is more or less true of you, find the number between 1 and 5 that best describe you.**

1	2	3	4	5
stronlgy agree	disagree	both agree and disagree	agree	strongly agree

During learning Nightjohn…

1.	I was able to do really well	**1**	**2**	**3**	**4**	**5**
2.	I was able to do a very good job	**1**	**2**	**3**	**4**	**5**
3.	What I was learning was very important to me	**1**	**2**	**3**	**4**	**5**
4.	I cared a lot about what we were leaning	**1**	**2**	**3**	**4**	**5**
5.	I thought a lot about what I was doing	**1**	**2**	**3**	**4**	**5**
6.	I really wanted to find out someting new	**1**	**2**	**3**	**4**	**5**
7.	I wanted others to notice how smart I was	**1**	**2**	**3**	**4**	**5**
8.	I planned out what I was doing	**1**	**2**	**3**	**4**	**5**
9.	I always went back over things I did not understand	**1**	**2**	**3**	**4**	**5**
10.	I thought a lot about whether I understood what I was doing	**1**	**2**	**3**	**4**	**5**
11.	We replied a lot on each other to understand our work	**1**	**2**	**3**	**4**	**5**
12.	It was important to me that I learn as much as I could	**1**	**2**	**3**	**4**	**5**
13.	We helped each other remember what we were doing	**1**	**2**	**3**	**4**	**5**
14.	We discussed what was most important with each other	**1**	**2**	**3**	**4**	**5**
15.	Other students helped me keep track of what I was doing	**1**	**2**	**3**	**4**	**5**
16.	I used someone ele's answers or ideas instead of figuring it out myself	**1**	**2**	**3**	**4**	**5**
17.	I guess a lot in order to finish quickly	**1**	**2**	**3**	**4**	**5**
18.	I checked to see what other kids were doing and did that too	**1**	**2**	**3**	**4**	**5**
19.	I did not really bother with the hard parts	**1**	**2**	**3**	**4**	**5**
20.	I felt like I was learning something useful	**1**	**2**	**3**	**4**	**5**
21.	Other students helped me understand what was important	**1**	**2**	**3**	**4**	**5**
22.	I wanted to do a better job than the others	**1**	**2**	**3**	**4**	**5**
23.	I always made sure my work made sense to me	**1**	**2**	**3**	**4**	**5**
24.	Other students kept me from giving up when it got hard	**1**	**2**	**3**	**4**	**5**
25.	I set goals for my work	**1**	**2**	**3**	**4**	**5**
26.	I let others work on the hard parts	**1**	**2**	**3**	**4**	**5**
27.	I was learning something interesting to me	**1**	**2**	**3**	**4**	**5**
28.	My main goal was to learn as much as I could	**1**	**2**	**3**	**4**	**5**
29.	I wanted to learn as much as possible	**1**	**2**	**3**	**4**	**5**
30.	It was important to me that I understood the work	**1**	**2**	**3**	**4**	**5**

31. It was important that others thought I was smart	**1**	**2**	**3**	**4**	**5**
32. I tried to make the others think I did a good job	**1**	**2**	**3**	**4**	**5**
33. I want to others to think I was smarter than they were	**1**	**2**	**3**	**4**	**5**
34. I tried to make it easy so I would not have to think hard	**1**	**2**	**3**	**4**	**5**
35. I wanted to do things as easily as possible so I would not have to work hard	**1**	**2**	**3**	**4**	**5**
36. I really wanted to learn more than just the answer	**1**	**2**	**3**	**4**	**5**
37. I tried to do only what I had to do	**1**	**2**	**3**	**4**	**5**
38. I just wanted to do what I was supposed to do and get done	**1**	**2**	**3**	**4**	**5**

APPENDIX E. A CURRICULUM-BASED ACHIEVEMENT TEST VALIDITY CHECKLIST

Academic Achievement Test Validity Checklist

Directions:

- Please input your thoughts about each achievement test item based on category, level, and whether you taught it explicitly or not.
- You can check more than one category if you think the item measures more than one category.

Item	**Categories**			**Level**			**Is question appropriate for your class?**		
	PART A[1]	PART B[2]	PART C[3]	Low	Mid	High	Low	Mid	High
Q1									
Q2									
Q3									
Q4									
Q5									
Q50									

[1]Recall of detailed information; [2]Comprehension of themes and characters;
[3]Comprehension of historical/social contexts.

APPENDIX F. A CURRICULUM-BASED ACHIEVEMENT TEST

ORAL DIRECTIONS

When students are seated and equipped with a test and a pencil, say:

Make sure that you have 3 page test packet. Now print your name and other information as accurately as possible.

After students have written their name and other information, say:

This test is to measure how much you will learn after learning "Nightjohn" curriculum. I want to you respond to the questions as accurately as possible. **Do not guess wildly at any answer**. **If you have no idea what the answer is, leave a blank**. The result of this test can be used to yield your grade.

When students are ready to begin the questionnaire, say:

Be careful that there are questions at the back side of each page too. And you will have 20 minutes to finish this test. Again, **do not guess wildly at any answer**. **If you have no idea what the answer is, leave a blank**

Time : 20 minutes

PART I: RECALL OF INFORMATION:

1. Who is the **narrato**r of Nightjohn and what type of **point of view?**
    A. Nightjohn, first person point of view
    B. Nightjohn, third person point of view
    C. Sarny, first person point of view
    D. Sarny, third person point of view

2. What was **the first word** that Sarny learned from Nightjohn?
    A. Cotton
    B. Tobacco
    C. Bag
    D. Sarny's name

3. Nightjohn and Sarny wrote alphabet and words on (①) because (②). Choose the words that are most appropriate to fill the blanks.
    A. ①: paper ②: paper was effective to use
    B. ①: wall ②: Sarny needed to practice reading
    C. ①: wood ②: it was easy to get
    D. ①: dust/soil ②: it was easy to erase

4. What were the **TWO** reasons Nightjohn thinks slaves should learn to read and write?
    A. To write about what happened to them by owners
    B. To read important documents
    C. To ask help from others in the North
    D. To have a better future

5. What did Sarny trade for learning to read with Nightjohn?
    A. Cornbread
    B. Tobacco
    C. Water
    D. Salt

6. Which one of the following events happened **last**?
    A. Nightjohn said he had gone to the North
    B. Sarny's birth mother left Waller's plantation
    C. Mammy (Dealey) noticed that Sarny had learned to read
    D. Pauley was whipped after meeting his girl friend
7. What was the legal punishment for slaves who learned to read and write?
    A. Whipping on the back
    B. Working the whole day without water and food
    C. Chopping off their thumb
    D. Being sold to another plantation

8. What job was assigned to slave children on the southern plantations **described in this novel**?
    A. Working in the cotton field
    B. Protecting the garden from bugs
    C. Going to school for slaves to learn farming
    D. Caring for the plantation animals

9. Which of the followings was **NOT TRUE** about slave life described in this novel?
    A. They worked from before sunrise to after sunset
    B. Establishing family ties was difficult
    C. They could not travel to meet their families
    D. Typically a mother and her children lived together

10. Why was Pauley cruelly whipped?
    A. He did not work hard
    B. He broke Waller's rules
    C. He did not show respect to Waller
    D. He learned to read

PART II: UNDERSTANDING OF THEMES AND CHARACTERS

1. What objects represented the power that Waller relied on?
    a. Reading and writing
    b. Whip and gun
    c. Law and money
    d. All of the above

2. Which of the following was **NOT TRUE** about the meaning of "Night" in **Night**john's name?
    a. The time he would teach Sarny to read
    b. The time when slaves were less oppressed
    c. The time he will run away from Waller to the North to get his freedom
    d. The time when he would take a rest after hard works

3. Which of the following were **TRUE** characteristic of "Sarny?"
    a. Limited experiences beyond a plantation life
    b. Hungry for learning
    c. Quiet and thinking but resisted Waller
    d. All of the above

4. Which of the following was **NOT A TRUE** characteristic of "Mammy (Delie)?"
    a. Protector of a child
    b. Faithful
    c. Good relationship with other slaves
    d. Respectful of rules and laws

5. When Nightjohn first came to Waller's plantation, he had a lot of scars on his back. What did these scars mean?
    a. He did not work hard at the other plantations
    b. He was an expensive slave to purchase
    c. He had resisted not being free
    d. He had hard time in the North

6. Which of the following was **TRUE** about the power of a series of character's described in the novel?
    a. Waller had power. He was called master and owner
    b. Nightjohn had power. He could teach others
    c. Mammy(Delie) had power. She took care of slave children
    d. All of the above

7. Which of the following was **NOT TRUE** about the power of literacy in human life described in the Nightjohn.
    a. Literacy brings freedom
    b. Literacy provides the will to want what they do not have now
    c. Literacy provides an opportunity to resist injustice
    d. Literacy is a quick solution to get freedom from owners

8. Despite the differences in ages, Sarny and Nightjohn are very similar. Which of the following is **the most accurate description** of how they were alike?
    a. They wanted to run away from Waller
    b. They both had a strong will
    c. Their fear of Waller's power
    d. Their understanding and experience of a free life

9. What would Sarny do after parting from Nightjohn?
    a. show respect for her owner
    b. teach other slaves to read
    c. run away from Waller's plantation
    d. quit learning to read and write

10. Nightjohn wanted to use **this** as a weapon to fight for slaves' rights, and Waller already had **this** as one of his powers. What is **this**?
    a. Gun
    b. Money
    c. Literacy
    d. Slave community

PART III: UNDERSTADNING OF SOCIAL AND HISTORICAL CONTEXT OF THE NIGHTJOHN

1. What is the historical period "Nightjohn" represents? This question is answered by subsequent items included in the survey
    a. When the slavery began in America
    b. Mid 1700s
    c. Mid 1800s
    d. Mid 1900s

2. Why did the slave owners fear their slaves to learn to read and write? Choose **all the reasons** that apply.
    a. Because slaves would increase communication among themselves
    b. Because slaves would have more opportunities and ways to resist to their owners
    c. Because slaves would be able to write a free pass and therefore escape to freedom
    d. All of the above

3. Which of the following is **NOT TRUE** about American slavery during the 1800s?
    a. Slaves could go to church with their owners
    b. There was Sunday school for slaves
    c. Slave owners built "The Underground Railroad" to stop slaves escape from plantation to freedom
    d. There were many white people who helped slaves escape to freedom

4. Why did Southern plantations have so many slaves?
    a. Cotton industry was labor intensive.
    b. People thought that slaves from hot Africa would be relatively effective working in Southern areas.
    c. They were cheap source of labor.
    d. All of the above

5. The Emancipation Proclamation
    a. freed the slaves and abolished slavery in all the states of the Union and the Confederacy
    b. freed slaves only in areas in rebellion against the United States but not in areas that remained loyal.
    c. was formulated by the Radical Republicans and issued by Lincoln despite his strong personal objections
    d. convinced England and France to enter the war on behalf of the Union in order to win the crusade against slavery.

6. During the Civil War, northern black leaders such as Frederick Douglass worked as army recruiting agents because they believed that…
    a. Blacks would get to see their loved ones in the South only by fighting for the Union.
    b. Black participation in the army would be a step toward black citizenship.
    c. It was the best way to prevent blacks from being drafted.
    d. Blacks were more resistant to the diseases that ravaged white soldiers

7. Which of the following was **NOT TRUE** about slavery as a labor system?
    a. Slavery was worth more in terms of investment than all the land in the South.
    b. As slavery spread into the Deep South, wealth and power became more equally shared among the various classes of white southerners.
    c. It was slavery that made possible the South's "mass production" of agriculture products for export.
    d. Only a minority of Southerners owned slaves.

8. Manufacturing in the Old South lagged behind that in the North because
    a. black labor was incompatible with industry.
    b. white leaders in the South were more concerned with prestige than with profits.
    c. the South lacked important natural resources.
    d. cotton was a more profitable investment.

9. Which was true of free blacks living in the North during years prior to the Civil War?
    a. All Northern states granted free blacks the right to vote.
    b. Racial tensions often exploded into riots.
    c. Free public education was open to blacks.
    d. Economic opportunities for employment matched those given to recent immigrants.

10. Despite earlier efforts to settle the issue, the slavery question became a major issue in the 1840s and 1850s because
    a. The U. S. Supreme Court had a northern majority.
    b. The nation was expanding to the West.
    c. The evangelists of the Second Awakening raised the issue frequently.
    d. The existing political parties needed an issue that would unite their members.

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